SERIES
NEW DECISION-MAKERS,
NEW CHALLENGES

NOTRE EUROPE
JACQUES DELORS INSTITUTE

FROM THE EUROPEAN ENERGY COMMUNITY TO THE ENERGY UNION

A POLICY PROPOSAL FOR THE SHORT AND THE LONG TERM

Sami ANDOURA
and Jean-Arnold VINOIS
Foreword by Jacques DELORS

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The authors are very grateful to Jacques Delors and Pascal Lamy for sharing with them their vision, ideas and proposals.

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They also express their thanks to Stefan Bössner who assisted them in their research and analysis all along this 18 month's process.

This report is not exhaustive, and builds on the authors' personal and independent vision, knowledge and experience.

FOREWORD

by Jacques Delors

Breaking away from short-termism and inward-looking attitudes

The energy sector is no exception to the current weakness of the European political system, and also of national systems, marked by pervasive short-termism and an increasing tendency for European countries and citizens to look inwards. The immediacy of politics and financial profit outweigh all other factors. Countries are isolating themselves due to the structural issues affecting Europe, which run much deeper than European institutional challenges. The European people are afraid of globalisation and of the future. Under pressure from political events and economic and social uncertainty, they are losing the feeling of having a common heritage – of living and of knowing how to live together.

In our globalised and increasingly interdependent world, which upsets the economic, political, social and environmental balances, it is the importance and role of Europe that are dwindling inexorably. Does Europe still have a say and does it want to say?

We must now find a new impetus, and reconsider how we live and govern together. This European drive must overcome differences and find strength in a common vision and new projects involving all Europeans to plot a course for the future. The energy transition is an integral part of this movement.

The European Union currently implements common policies in key fields such as trade, agriculture and transportation, to name but a few. The EU has also created an economic and monetary union, a banking union regulated by the European Central Bank, and an area of free movement that is unique in the world. Why then, could energy not be promoted to this level, and take its logical

and necessary place in the European project, in line with what European citizens have been demanding for several years now?

The Energy Union: a long-term European energy transition project

The European Council and the European Commission recently called for an Energy Union, of which the content has not yet been defined. Better still, its creation is at the forefront of the organisation and priorities of the new European Commission.

In order to assist the stakeholders involved in the difficult and complex task of launching this Energy Union, the Jacques Delors Institute has written an in-depth report describing the current energy policy, its strengths and its weaknesses. This report lists the key European projects and resources that should be developed to achieve a real Energy Union based on the fundamental European values and principles of integration, cooperation and solidarity.

The current unexpected drop in oil prices, which is sure to have a positive overall effect on the European economy, should not divert attention from the fact that oil prices have fluctuated between USD 25 and 150 in recent years. Assuming with certainty that oil prices will remain highly volatile in the years to come and that the earth's temperature will continue to rise, the content proposed by the Energy Union is neither unrealistic nor impracticable.

The Energy Union is the catalyst for the necessary energy transition in Europe, and must be used to overcome the fragmented, short-termist and isolated approach that is dangerously looming over Europe at this time.

A European model for sustainable economic development

The Energy Union is based on a sustainable economic development model. The focus of the European energy system must shift from the supply side to the demand side, and from a rampant production model to a model aimed at reducing consumption, and therefore demand. Tackling waste by producing, transporting and consuming energy in a sensible way is the cornerstone of the transition and is known as energy efficiency.

Making this a priority in Europe involves placing energy efficiency on an equal footing with other energy resources, and to deal with them together as part of a single energy transition. To make this happen, a decisive step must be taken towards the transition, guided by a stable and credible carbon price. The optimum instrument, in particular against the backdrop of a downward trend in oil prices, remains EU-wide carbon taxation. At the same time, subsidies for fossil fuels must be phased out as soon as possible.

The Energy Union creates wealth and well-being for all Europeans. A new industrial strategy must be developed based on innovation and the implementation of digital and information technologies in the energy sector. If the EU wishes to become the global leader in low-carbon technologies, it must launch this revolution from a European valley for energy transition innovation, instead of it coming from Silicon Valley, as it does today.

Research, widely fragmented in both the public and private sectors, must be federated in rational terms and integrate the various stakeholders along the green technology development chain. Public and private investments must focus on high added-value innovation that creates jobs, rather than on the deployment of mature technologies on the market.

European solidarity: a project for all

The Energy Union is inclusive and promotes solidarity where necessary, such as ensuring an energy supply for all at a universally affordable price. Europe's new drive must now come from the younger generations who live Europe on a daily basis, and who feel European when they travel beyond the physical, political and cultural boundaries of the European Union. Offering them a better education and training in the challenges and opportunities provided by this new European energy transition model is a task that the European Union is capable of performing, as it has already shown through the Erasmus programmes, because they are legitimately concerned about the future of our planet earth.

The energy transition will also affect jobs in the energy sector, both by creating new jobs and by phasing out others. A European social dialogue in the energy sector will be necessary to support this far-reaching change.

Energy poverty is also a growing phenomenon that must be addressed by Europe as part of a genuine social policy in the field of energy. Energy solidarity is not incidental to the market. It must permeate it at all levels. Energy poverty, which goes beyond energy prices, calls for a comprehensive approach that offers affordable and stable access to energy resources and is based on the new opportunities provided by the energy transition as a whole. In the name of solidarity, the European Union must also assist the African, Asian and many other populations who do not even have access to energy.

European energy diplomacy

The Energy Union avoids a nationalistic approach that aims to maintain costly and unrealistic energy independence in an interdependent world. European energy diplomacy strives to share and defend our energy transition project across the globe. It must naturally defend European interests in European trade policies. These policies must together ensure the diversification of suppliers and the access to energy resources located outside the borders of the EU rather than maintaining the current individualisation of risks facing each member state acting separately.

Interdependence and reciprocity in market access and the opening up to foreign investments must be two mainstays in such a strategy. European energy diplomacy must also proudly acclaim our vision and interests with regard to the energy transition. Whether on a bilateral or multilateral level, the key idea is not speaking with one voice, but conveying a clear and unequivocal European message, regardless of the spokesperson.

The Energy Union requires a shared understanding of national, European and international energy challenges, based on a collective and comprehensive analysis of the constantly changing political, economic, societal and market dynamics. A European Energy and Climate Information Agency is an essential tool so that the European Union can build its energy future on sound foundations.

Dynamic and inclusive European governance

The Energy Union is a return to simplicity. The community method must be placed back at the heart of the interplay between the European institutions,

and must inspire the essential new governance of players in the energy sector. The energy transition will only be successful if it is based on all stakeholders working together. In addition to the players already well established in the European system, citizens and consumers, cities and rural areas, networks, regions, innovators, multipliers, new coalitions and civil society as a whole must be involved in the future European governance of the Energy Union in a modern and intelligent manner. A virtual energy forum bringing together all players and simplifying the current consultation methods would make the Energy Union accessible to all and ensure its acceptance by all.

These are the main advantages of an Energy Union comprised of the 28 member states. The critical mass of the European Union, its internal market and its 500 million citizens/consumers are a key asset and the benefits of this must be optimised. We must use to our advantage the increasing interdependence in the energy sector and strengthen complementary links between national energy systems and resources.

Successful governance is based above all on the integration of the internal market through cross-border infrastructure, but also on the application of communication and network interaction tools that will quickly overhaul the entire energy system.

However, the current internal energy market is not moving in this direction, and under no circumstances gives scope for such an improvement in quality. This is why the priority for the European Union in the very short term will be to revise the European energy policy currently in force. This is the necessary step without which the Energy Union project cannot be launched on sound, shared and long-term foundations.

An absolute precondition: the revision of the European energy policy in the very short term

The new European framework for the 2030 energy and climate package is marked by low levels of European drive, particularly as regards the promotion of renewable energy and energy efficiency. What is even more worrying is that the European Union has not resolved the contradiction between the continuing sovereign approach of member states and the clear European and global

dimensions of the problems identified, leaving more scope for action to member states who wish to retain control over their energy mix while favouring their national champions.

If it is not offset by reinforced European governance, this step backwards may dangerously throw energy policy back into national arenas, undoing what was bravely put on the European agenda in 2007.

Despite the many achievements and successes observed in recent years, the European energy policy suffers from a design flaw and structural inadequacies that we had already highlighted in 2010. The crises and shortcomings that have occurred since then have demonstrated the relevance of the European Energy Community proposal that I put forward with Jerzy Buzek and which was developed by the Jacques Delors Institute. What is essential and which has not been done must be done to stop the current headlong.

Ten proposals of tangible actions to advance energy policy in three key areas

First of all, the internal energy market must be finalised as an instrument for the optimisation of energy resources by all stakeholders, including consumers.

The first requirement is the implementation in all member states of all the rules in the third package and the network codes that are currently being finalised. The creation of the infrastructure required for the market's physical integration and the removal of energy islands must be stepped up. The retail market must operate within a European framework.

The security of gas and electricity supply must be governed by clear European standards and cross-border preventive actions must be conducted in consultation with the various stakeholders. This implies further increasing the involvement of all stakeholders and strengthened and more operational regional cooperation to foster solidarity and offer more effective and less costly solutions for all.

Next, the external dimension must be addressed to give the European Union its rightful role in the international arena, and in particular with regards to

neighbouring third countries. Intergovernmental agreements between member states and third countries must fully comply with the internal market and may be concluded by the European Union to leverage its collective bargaining power.

Relations with immediate neighbours must be strengthened with a view to creating a pan-European area already outlined by the European Energy Community, without forgetting the Mediterranean countries. Energy relations with Norway and Switzerland must be embodied in more extensive partnerships than that of ETFA or the EEA. Similarly, relations with Russia and Turkey must be taken to a strategic level that reflects the interdependence of our respective economies rather than counting on short-term actions lacking an overall vision.

Lastly, European governance must be strengthened in the field of energy and the regional dimension must be seen as an essential intermediary step to a broader geographical integration.

The European Commission, due to its unique status among the institutions, must play its full original and unique role as the driving force behind ambitious and justified initiatives, a facilitator of dialogue and the guardian of the Treaties. This implies an improved level of transparency, monitoring and regulation and high-quality communication on the existing situation, its problems and the solutions to put them right.

Lastly, the European energy policy must not be developed with a silo mentality. It must integrate the environmental policy which is closely linked in its objectives and in its means. It must also be interconnected with all other relevant policies, in a coherent and proactive manner, including policies of industry, trade, transportation, agriculture, development cooperation and external policy.

A pragmatic approach made up of practical, strong and unifying actions based on coherent objectives.

Although they create a new European sovereignty, none of these practical actions, ranging from the reform of European energy policy to the development

of the Energy Union, require institutional changes or modifications to existing treaties. The European heads of state and government, who agreed in 2007 to deal with energy issues directly in the European Council, will need to demonstrate the open-mindedness and boldness that are essential for the development of this new collective vision of the energy transition in Europe and across the globe. We welcome the priority granted to the Energy Union by the European institutions. It must be followed by practical, strong and unifying actions that must now be put forward by the European Commission and debated, adopted and implemented by all stakeholders. It is time to regain the enthusiasm for an idea that remains an utopia, but that can be achieved. We have no time to lose.

In support of this declaration, and for a more in-depth presentation of the grounds and proposals for the European Union's energy future, Sami Andoura and Jean-Arnold Vinois have written the new Jacques Delors Institute report, enclosed herewith.

Jacques Delors
Founding President of the Jacques Delors Institute

EXECUTIVE SUMMARY
30 FINDINGS, 10 IMMEDIATE ACTIONS AND 10 LONG-TERM BUILDING BLOCKS

The European Union did not have a European energy policy for long but only an internal market and the competition policy for electricity and gas flanked by measures adopted in line with the EU's climate policy, and without any concrete foreign policy dimension. In 2007, there was a great hope to progress towards a European energy and climate policy, driven by a large consensus among EU member states and energy stakeholders, supported by European citizens, and resulting in the 2020 Energy and Climate Package. Seven years later, the current debate reveals the disappointment of all players, frustrated not only by the economic crisis but also by many other unexpected failures of the European energy policy.

In 2010, the Jacques Delors Institute launched an in-depth study of the future of European energy policy based on Jacques Delors' policy proposal for a "European Energy Community". It opened up a wide debate with local, national and European public, private, and civil society stakeholders from the energy sector and beyond. Four years later, the adoption of the 2030 Energy and Climate Framework by the European Council and the start of a new EU political and institutional cycle in 2014 give the chance to assess the state of play of the European energy policy and to identify the necessary new paths to ensure the desired European integration and reap all its benefits. At the same time, the new concept of Energy Union, which has been advocated by the new EU leaders, without giving it a concrete content yet, opens a wider debate on the future challenges to be addressed in the field of energy.

Against this background, the present report examines the evolution of the European energy policy from 2007 to 2014, including the most recent developments and the adoption of a new 2030 EU Energy and Climate Framework. The strengths and weaknesses of the European energy policy are identified

and assessed in thirty findings. Relying on the conclusion that the existing European energy policy requires additional measures, the report suggests the three key objectives to be achieved in priority by a comprehensive European energy policy. It expresses ten meaningful recommendations for action, together with concrete remedies, policy instruments and institutional frameworks that should be implemented in the short-term within the new EU institutional cycle. Last but not least, it attempts to bring forward-looking ideas and key areas for action to achieve an ambitious and inspirational Energy Union, and to make it a fundamental element of the solidarity between the member states within the European Union and beyond in Europe.

1. Critical assessment of European energy policy's strengths and weaknesses: 30 findings

Although much has been achieved in the last decade, it has not removed the fragmentation of the European energy system. Sometimes, even positive developments have come with shortcomings which remain largely unaddressed. The integration of the EU energy market is far away. The EU struggles to act collectively on the international scene. And renewed national interventions have increased the risk of diverging and conflicting responses and prove the reluctance of the member states to govern together the energy challenges and to trust each other. The adequate EU governance to deal with the lack of coordination and cooperation between EU member states and stakeholders is missing. The EU cannot directly set the direction of research and development, investments, infrastructures, diversification or taxation policies that will allow it to achieve its competitiveness, sustainability and/or security of supply objectives. There is no guarantee that the present approach will be sufficient to bring about the economic, industrial, and societal changes necessary for the EU transition to a low-carbon economy by 2030–2050.

The EU energy policy is now half way between national policies mainly driven by national considerations and a common energy policy based on integrated energy markets. The European energy policy has brought a real convergence of the 28 national energy systems, models and regulatory framework that is unique on the international scene and irreversible at European level. This is this side of the coin that needs to be emphasized. Past successes and current strengths of European energy policy illustrate that there are a lot of things

that can be done in a concrete and pragmatic way when collective vision, well-identified objectives, leadership and political will, binding rules and the right regulatory, infrastructures and financial instruments are aligned. As such, all the positive changes that occurred, as strengths of EU energy policy, should be reinforced as the engine of the next steps to be taken. There is no question to ignore them and to go back to the old days.

Finding 1. The enlargement of the European Union has been (and remains) a tremendous challenge

Finding 2. Wholesale markets are working

Finding 3. A welcome mobilisation of all players

Finding 4. New model of governance such as co-regulation

Finding 5. Regional cooperation has emerged but remains *ad hoc* and voluntary

Finding 6. Progressive integration of networks is visible but can be accelerated

Finding 7. Security of electricity supply is not framed at European level

Finding 8. Security of gas supply is framed at European level but can be improved

Finding 9. Retail markets are not working satisfactorily

Finding 10. No effective demand response management

Finding 11. Electricity Market design requires corrections

Finding 12. Several national champions are becoming European and international players

Finding 13. National interventions remain too obstructive

Finding 14. Lack of compliance is too frequent

Finding 15. Lack of transparency, accuracy, and monitoring of national data

Finding 16. Greenhouse gas emissions reduction as expected

Finding 17. Renewable Energy Sources deployment more successful than anticipated but also more complex

Finding 18. Energy efficiency is now taken seriously but remains an underdeveloped objective

Finding 19. Significant EU economic and financial instruments are geared towards the implementation of the 2020 strategy

Finding 20. EU international ambitions in climate change are revised downwards

Finding 21. The competition on low carbon innovation might be won by others

Finding 22. Energy taxation remains fully national and is not used to meet the agreed EU objectives

Finding 23. Diversification of external supply sources, routes and counterparts is under way but not with sufficient determination

Finding 24. The external dimension of EU internal market is being progressively developed

Finding 25. The integration of the neighbourhood in the EU market is progressing slowly

Finding 26. The relationships between the EU and Russia are in need of repair

Finding 27. The integration of energy in the general EU external policy is necessary to have an impact

Finding 28. Fragmentation of the system

Finding 29. The risk of muddling through

Finding 30. An historic European convergence of national energy profiles and systems

2. The needed technical approach: ten immediate actions for the European energy policy and its stakeholders

The long-term project to be carried out by the Energy Union will only be possible if the European energy policy is revised and finalised in the short-term. If properly addressed, the European energy policy is a powerful instrument that can bring a wide range of pragmatic and efficient answers to the identified shortcomings. There are three key objectives that a comprehensive European energy policy should achieve in priority. The first one is to achieve the European internal energy market of electricity and gas, which has come to a point of no return. An integrated, competitive, liquid and resilient EU energy internal market, based on the adequate regulatory framework and interconnected infrastructures remains the key tool at EU's disposal for achieving all its essential energy objectives at the same time.

The second one is to collect the benefits of the external dimension of the European internal energy market. An EU approach in certain key areas is now necessary to allow that bilateral deals by individual member states and companies with suppliers and transit countries benefit the entire EU market, but also that no third country/company can threaten key EU energy assets and infrastructures or engage in targeted reductions of energy supplies. The third one is to assert the governance of the European energy policy, based on a strong, coherent, and modern European energy regulatory space governed by common institutions enhancing coordination and cooperation between all actors and policy fields within a consistent framework.

And there are ten meaningful actions, together with concrete remedies, policy instruments and institutional frameworks that should be implemented in the short term in the new EU institutional cycle. Some of the actions proposed are new. Others are a *post hoc* rationalization of the existing system and current

shortcomings. All these actions should bring the EU at a higher level of integration in the field of energy.

Action 1. A credible and stable EU regulatory framework for the full integration of the European internal energy market

Action 2. A European framework for security of gas and electricity supply

Action 3. Increased empowerment of key European stakeholders

Action 4. Enhanced cooperation between member states at regional level

Action 5. Ensuring compliance of intergovernmental agreements with the EU internal energy market

Action 6. Moving towards a pan-European energy market with the EU and its Southern and Eastern neighbours

Action 7. Stronger leadership and authority of the European Commission

Action 8. Improved transparency, monitoring, and consolidation for a better regulation

Action 9. Further integration of energy into wider EU policies

Action 10. Lessons from past success: learning from key elements at the roots of EU's strengths in the field of energy

3. Boosting the European project: the Energy Union

The Energy Union is the catalyst for the necessary energy transition in Europe, and must be used to overcome the fragmented, short-termist and isolated approach that is dangerously looming over Europe at this time. Concretely, the Energy Union is capable to offer a forward-looking European project for all, under two conditions. It must be tangible: speeches and declarations with no follow-through will not suffice to answer citizens' concerns and call for a common political project in the field of energy. It must be inclusive and interactive:

the Energy Union should enable sustainable and inclusive economic development creating profits and social welfare for all. A resilient Energy Union will also engage Europeans in a new strategy aimed at defending shared interests and promoting common values in world energy affairs.

There will be no silver bullet bringing a unique response to this unique challenge and the related EU objectives of competitiveness, sustainable development, security of supply, or energy efficiency. Against this background, the future drivers of the Energy Union for transformative change around the energy transition should be (i) sustainable economic development, (ii) solidarity and inclusion, and (iii) global strategic action and resilience. Concretely, there are ten building blocks as cornerstones of the future Energy Union. These three main areas and ten building blocks for priority actions for the Energy Union over the next 5 years EU institutional cycle will lead to decisive changes, paving the way to greater integration, competition, cooperation, and solidarity in the energy field, both within and outside the EU.

Building block 1. A new economic growth model – A shift from the supply side to the demand side

Building block 2. An industrial energy strategy driven by innovation

Building block 3. Invest in education on the challenges and behaviours around the energy transition

Building block 4. A social energy policy

Building block 5. Innovative governance leading to the State of the Energy Union

Building block 6. Unity in diversity – European optimisation of resources and infrastructures

Building block 7. An energy trade policy for the defence and promotion of the EU's sustainable economic interests outside the EU

Building block 8. European public-private partnerships for low carbon energy cooperation and development

Building block 9. A European Energy Diplomacy – A single message with multiple voices

Building block 10. A European Energy and Climate Information Agency: a common platform for common analysis, understanding, and forward-thinking

Conclusion

None of these practical actions, ranging from the reform of the European energy policy to the development of the Energy Union, requires institutional changes or modifications to existing treaties. The European heads of state and government, who agreed in 2007 to deal with energy issues directly in the European Council, will need to demonstrate the open-mindedness and boldness that are essential for the development of this new collective vision of the energy transition in Europe and across the globe.

The next European institutional cycle will have to enable the adoption and implementation of the binding instruments reflecting the new realities and needs of the energy policy of the EU and its member states, paving the way for an increasingly necessary European energy policy and, at the same time, by devising what should be the common vision and collective approach towards the meaning, scope, and instruments to be developed under the value-added concept of an Energy Union.

The Energy Union and the European energy policy have a common goal: to promote the integration of energy markets for the benefit of citizens in Europe and beyond. Freedom from energy insecurity reduces the risks of conflict. Peace is what Europe is about. Humanity is at a crossroads. It is critical to start now the Energy Union for the long-term.

INTRODUCTION
ENERGY AT THE HEART OF EUROPEAN INTEGRATION

Energy has been at the heart of European integration from the beginning, with the 1951 ECSC and the 1957 Euratom Treaties, which provided for a common policy with specific energy tools based on supranational powers vested in a European authority. Subsequent EC treaties did not provide the EU with an overarching legal basis for dealing with energy issues. In short, the European Union did not have a European energy policy for long but only an internal market and the competition policy for electricity and gas flanked by measures adopted in line with the EU's climate policy, and without any concrete foreign policy dimension.

In 2007, there was a great hope to progress towards a European energy policy, driven by a very large consensus among EU member states and energy stakeholders, and supported by European citizens. After a bold Green Paper of the European Commission, the EU developed significant activities governed by the March 2007 European Council conclusions and the resulting 2020 Energy and Climate Package being major milestones in the making of a European energy policy. Since then, many actions have been developed in the way towards a European energy policy.

However, seven years later, the current debate reveals the disappointment of all players, frustrated not only by the economic crisis but also by many other unexpected failures of the European energy policy. The integration of the EU energy market is far away. The EU struggles to act collectively on the international scene. And renewed national interventions prove the reluctance of the member states to govern together the energy challenges, or worse, the lack of mutual confidence to share sovereignty at a higher level.

In 2010, the Jacques Delors Institute launched an in-depth study of the future of European energy policy based on Jacques Delors' policy proposal for a

"**European Energy Community**". It opened up a wide debate with local, national and European public, private, and civil society stakeholders from the energy sector and beyond.

Four years later, the adoption of the 2030 Energy and Climate Framework by the European Council and the start of a new EU political and institutional cycle in 2014 give the chance to assess the state of play of the European energy policy and to identify the necessary new paths to ensure the desired European integration and reap all its benefits. At the same time, the new concept of Energy Union, which has been advocated by the new EU leaders, without giving it a concrete content yet, opens a wider debate on the future challenges to be addressed in the field of energy. It is a real opportunity for European leaders to offer a new and future-oriented project of society around the energy transition to the citizens.

Against this background, the present report examines the evolution of the European energy policy from 2007 to 2014, including the most recent developments and the adoption of a new 2030 EU Energy and Climate Framework (Part 1). The strengths and weaknesses of the European energy policy are identified and assessed in thirty findings (Part 2).

Relying on the conclusion that the existing European energy policy requires additional measures, the report suggests the three key objectives to be achieved in priority by a comprehensive European energy policy. It expresses ten meaningful recommendations for action, together with concrete remedies, policy instruments and institutional frameworks that should be implemented in the short-term within the new EU institutional cycle (Part 3).

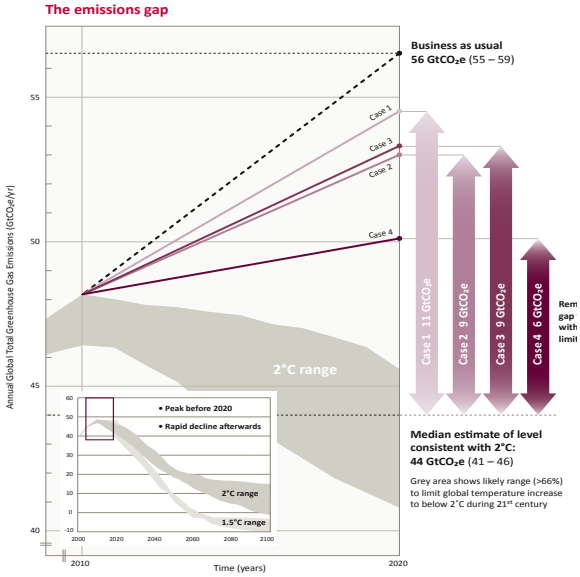
Last but not least, it attempts to bring forward-looking ideas and key areas for action to achieve an ambitious and inspirational Energy Union, and to make it a fundamental element of the solidarity between the member states within the European Union and beyond in Europe (Part 4).

1. From 2007 to 2014: great ambitions, adverse developments and a growing EU energy framework

1.1. In 2007: great ambitions for 2020 and a new energy policy for Europe

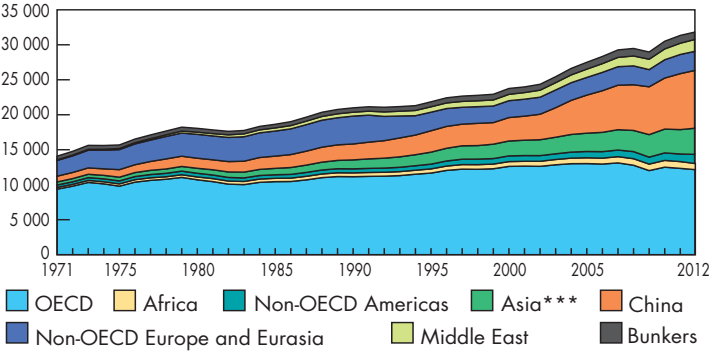
At global level, the fast economic growth in the early 2000s raised the fear of a lack of energy resources to meet the increasing world consumption mainly driven by China and India. At the same time it was leading to unsustainable levels of greenhouse gas emissions and volatile energy prices.

FIGURE 1 ► World GHG emission scenarios until 2020



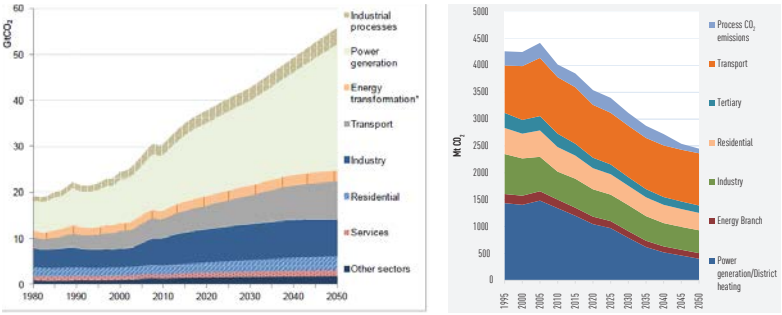
Source: UNEDP, Bridging the Emissions Gap – A synthesis report, 2011

FIGURE 2 ► Increase of CO2 emissions from fossil fuel combustion by region



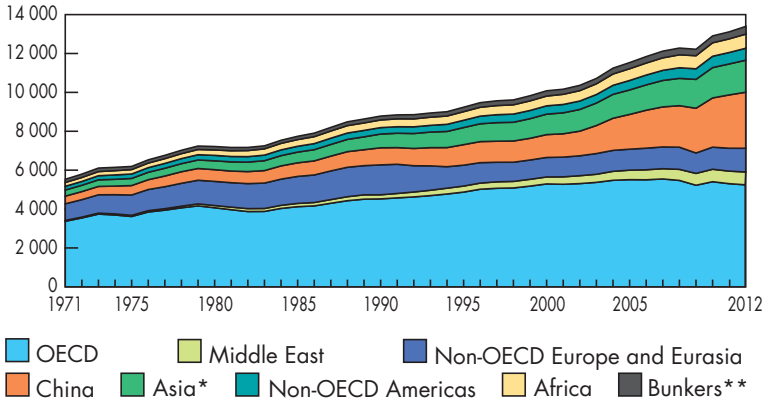
Source: IEA, Key World Energy Statistics, 2014

FIGURE 3 ► Global and EU emissions outlook



Source: European Commission, EU Energy-Transport and GHG emissions – Trends to 2050 – Reference Scenario, 2013; OECD, Environmental Outlook to 2050, Environmental Chapter, 2011

FIGURE 4 ► Increase of global energy consumption by region in Mtoe



Source: IEA, Key World Energy Statistics, 2014

Against this background, an ambitious "New Energy policy for Europe" was defined by the European Council in March 2007 and adopted by all heads of state and government. The key driver of this new energy policy was mainly the belief that Europe had to face, for a long time to come, two major intertwined crises:

- **an energy crisis**, with human activity consuming more resources than nature can provide, the lack of domestic fossil resources, and the growing dependency on imports;

- **an environmental crisis**, with climate change calling for a radical shift in the way that energy is produced, transported, distributed, stored and consumed.

The main objectives of the New Energy policy for Europe, which remain valid today, are to guarantee access for its citizens to energy at affordable and stable prices; to improve industrial competitiveness; to promote sustainable development and the transition to a low-carbon society; and to ensure security of energy supply for all Europeans. Within this energy policy "triangle" made up of sustainability, competitiveness and security of supply, sustainability appeared to all as the most urgent objective to be addressed.

The EU had the ambition to lead by example in fighting climate change in view of the needed international agreement for the post-Kyoto regime and to create huge economic and industrial opportunities with the development of new energy technologies (Renewable energy sources - RES and energy efficiency mainly). Some even talked about a new industrial revolution based on new clean/low carbon technologies that would also help the EU emerge from the economic crisis. The priority areas for action were: energy for jobs and growth, tackling security and competitiveness of energy supply through solidarity among EU member states, a more sustainable, efficient and diverse energy mix, fighting climate change, encouraging innovation, and relations with third countries.

The 2020 Energy and Climate Package established three main targets (the so-called 20-20-20 i.e. 20% of greenhouse gas emissions reduction compared to 1990, 20% of renewable energy in the gross final energy consumption and 20% improvement in energy efficiency compared to the business as usual scenario) to be achieved by 2020 by the EU and its 28 member states.

FIGURE 5 ► EU 1st Climate and Energy Package Objectives

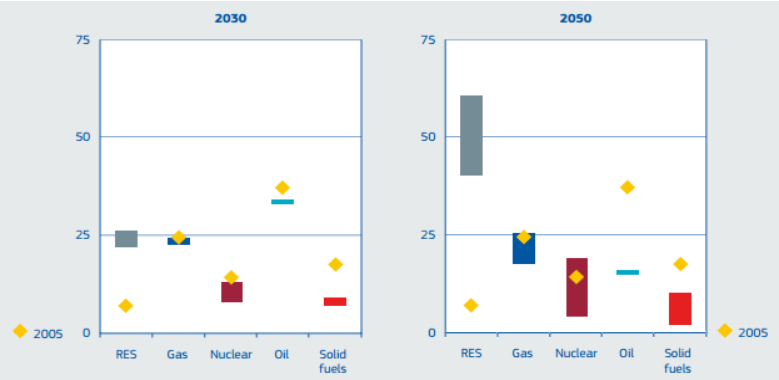
FIELD OF APPLICATION	OBJECTIVES 2020	WHAT DOES IT MEAN	WHERE ARE WE
Renewable energies	20% of energy consumed from RES in the gross final energy consumption	20% is the overall, EU-wide goal but each member state has different national targets	14.1% RES of gross final **energy** consumption in 2012
	10% in the transport sector	10% of the transport sector must come from RES sources such as biofuels	24.2% share of RES in gross **electricity** generation
			5.1% share of RES in fuel consumption of **transport** in 2012
GHG emissions	20% reduction compared to 1990 levels	No more than 4501.1 MtCO2e in 2020	In 2012, the EU 28 emitted 4544.2 MtCO2e
Energy efficiency	Saving 20% of the EU's primary energy consumption by 2020	No more than 1078 Mtoe of final energy consumption by 2020	1104.4 Mtoe of final energy consumption in 2012 (down from 1130.9 Mtoe in 2000)

Source: Aggregate data from Eurostat and EU legal documents

The three targets have been translated into individual national targets (binding and non-binding) together with national action plans for their implementation. They were enshrined into legally binding instruments: the EU-ETS and the Renewable Directives, together with the Third Internal Market Energy Package. Energy efficiency for which a binding target could not be agreed was the most critical area as the EU member states considered the measures to be taken as falling under their sole competence. It took four more years to adopt the Energy Efficiency Directive in 2012.

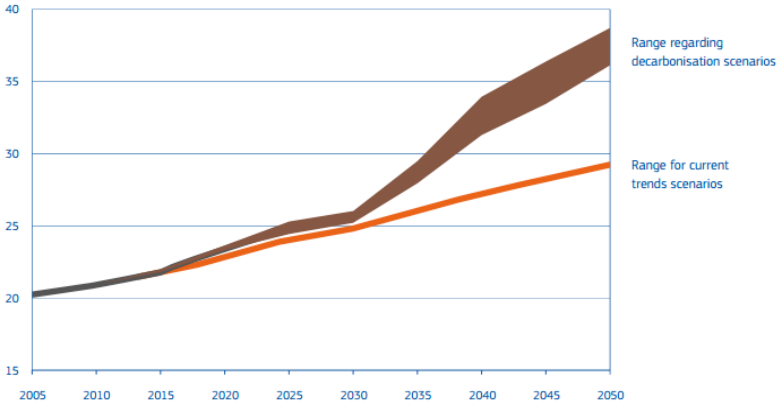
Lastly, based on the commitment made by the European Council that the EU should reduce its greenhouse gas emissions by 80-95% by 2050, the European Commission proposed a Roadmap towards a low carbon economy by 2050 which was never endorsed by the EU member states. This approach reflects the dominance of sustainability in the energy policy. The reduction of GHG emissions means a progressive elimination of all fossil fuels in the energy mix, unless technologies are enabling the decarbonisation of such fuels.

FIGURE 6 ► EU decarbonisation scenarios – 2030 and 2050 range of fuel shares in primary energy consumption compared with 2005 outcome (%)



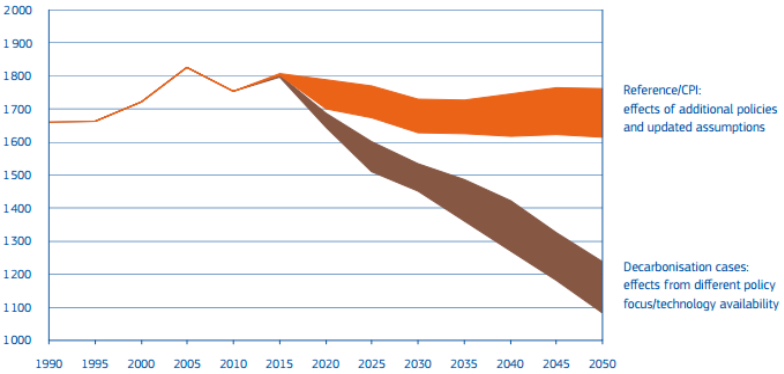
Source: European Commission, Energy Roadmap 2050, 2012

FIGURE 7 ► Share of electricity in current trend and decarbonization scenarios (% of final energy demand)



Source: European Commission, Energy Roadmap 2050, 2012

FIGURE 8 ► Gross energy consumption – range in current trend (REF/CPI) and decarbonization scenarios (million toe)



Source: European Commission, Energy Roadmap 2050, 2012

The entry into force of the Lisbon Treaty at the end of 2009 – introducing a new Energy Article 194 in the EU Treaty – offered the energy policy its first own legal basis. However, it did not fundamentally allow for a major change in the usual approach. Article 194 TFEU is a carefully crafted compromise between national sovereignty governing the energy mix, the exploitation of natural resources and energy taxation – three key components of any energy policy – and a shared EU competence for other areas.

It is worth to note that oil is usually not part of the energy policy, although it represents still more than one third of the energy mix of the European Union. The liquidity of the global oil market does not create the same worries as for gas and the fundamental dependency of transport on oil is not addressed in the energy security policy. This question would probably deserve more attention but it is not the scope of this report.

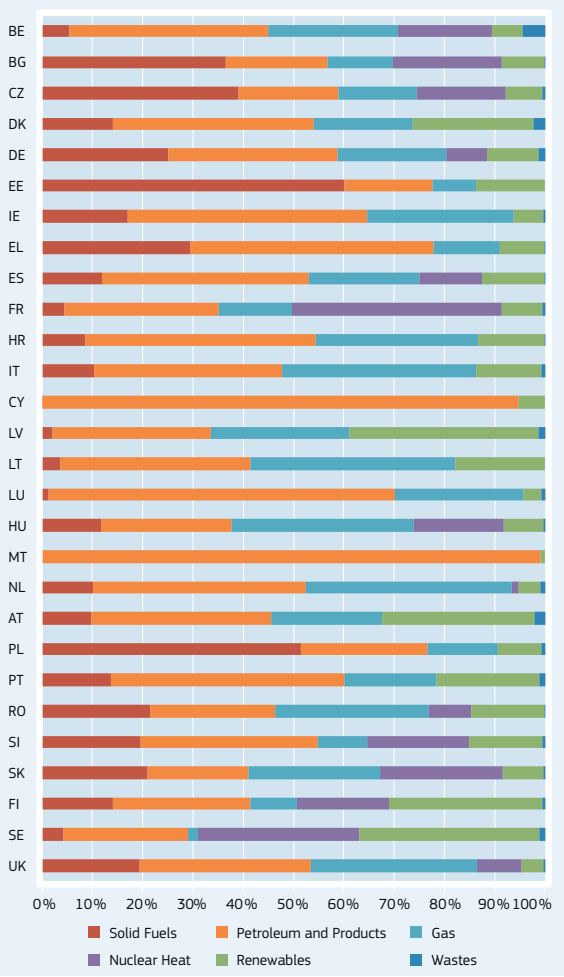
BOX 1 ► Article 194 of the Treaty on the functioning of the European Union (TFEU)

1. In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between member states, to: (a) ensure the functioning of the energy market; (b) ensure security of energy supply in the Union; (c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and (d) promote the interconnection of energy networks.
2. Without prejudice to the application of other provisions of the Treaties, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the measures necessary to achieve the objectives in paragraph 1. Such measures shall be adopted after consultation of the Economic and Social Committee and the Committee of the Regions. Such measures shall not affect a member state's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply, without prejudice to Article 192(2) (c).
3. By way of derogation from paragraph 2, the Council, acting in accordance with a special legislative procedure, shall unanimously and after consulting the European Parliament, establish the measures referred to therein when they are primarily of a fiscal nature.

As a consequence, EU member states have repeatedly responded to energy crises and challenges on their own terms. Is it possible to develop a European

energy policy with such strings attached by the EU member states? The contradictions between the national and European levels will appear very soon.

FIGURE 9 ► EU 28 gross inland energy consumption per source by member state

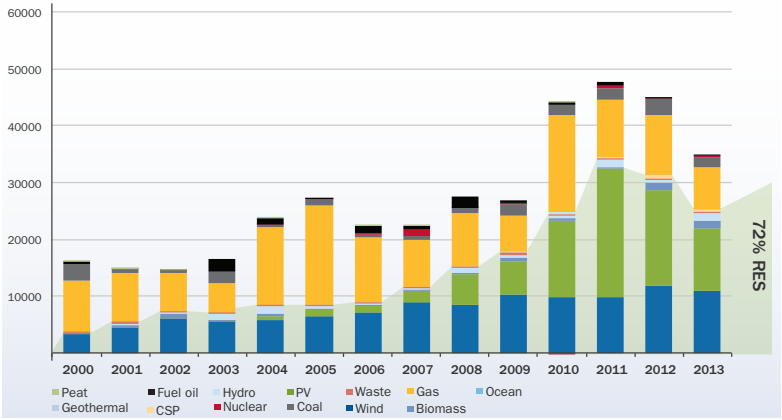


Source: European Commission, Statistical Pocket Book, 2014

1.2. From 2007 to 2014: adverse global and European developments

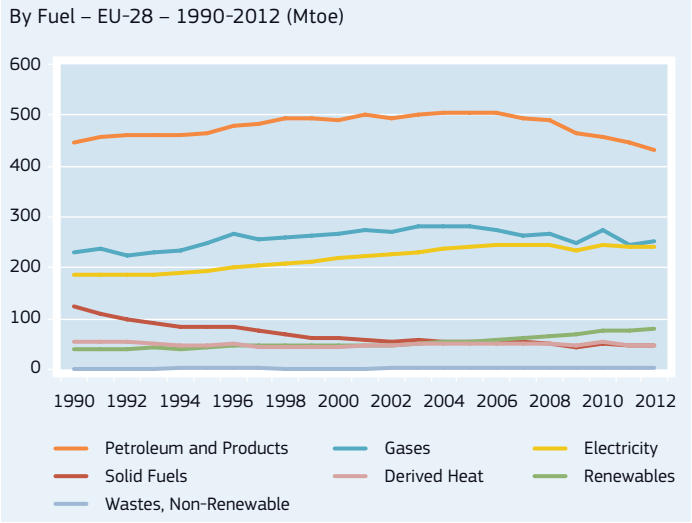
Between 2007 and 2013, major international events, some of them and not the least, originating outside Europe, have strongly affected the 2007 EU energy strategy. The financial crisis of 2008 was followed by the economic crisis, hitting particularly the EU and very deeply some of its member states. It showed also the EU's limited ability to find solutions quickly and to adapt its rules to the new environment emerging from these events. The economic crisis, combined with an extraordinary deployment of renewable energy sources (RES) based on generous national support schemes, entailed substantial price increases for individual consumers. It had however the positive effect of improving energy efficiency and reducing energy consumption, thereby also decreasing greenhouse gas emissions.

FIGURE 10 ► Capacity added per source 2000–2013 in MW



Source: EWEA, European Statistics - Wind in power, 2014

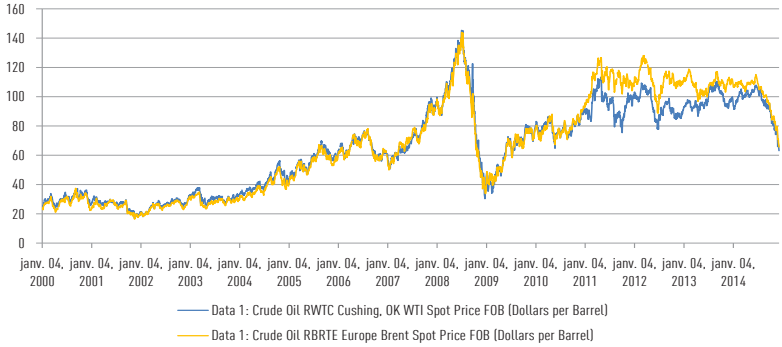
FIGURE 11 ► EU final energy consumption: evolution of actual consumption in Mtoe



Source: European Commission, Energy Pocketbook, 2014

Further, the oil barrel price, after a spike of 147USD in July 2008, remained at a very high level, driven by the instability of several producing countries and increasing consumption from emerging countries. It boosted investments in the exploration and production all over the world (except in the EU), and not least in the USA, where the shale oil and gas revolution started to take off.

FIGURE 12 ► Average annual price for Euro BRENT in USD

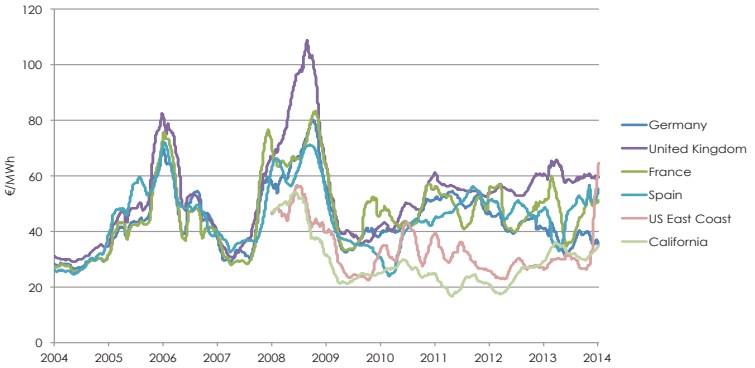


Source: IEA, Key World Energy Statistics, 2014

The European industry, especially the energy-intensive and/or those active in international markets perceived this shift as negatively impacting its competitiveness in terms of energy prices for both electricity and gas, and have threatened not to invest in Europe anymore while highlighting the risk of carbon leakage.

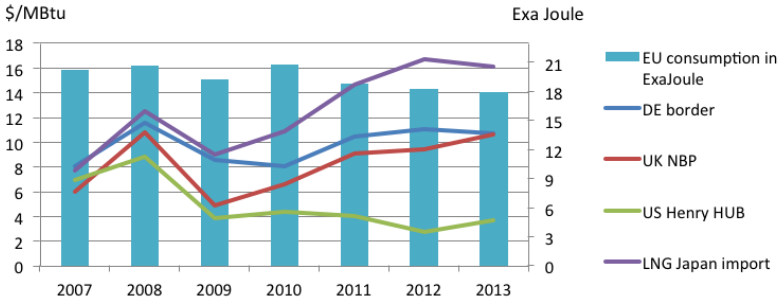
FIGURE 13 ► Electricity prices over the last years on selected European and American markets

Price variations over time are of a similar magnitude to variation across regions.



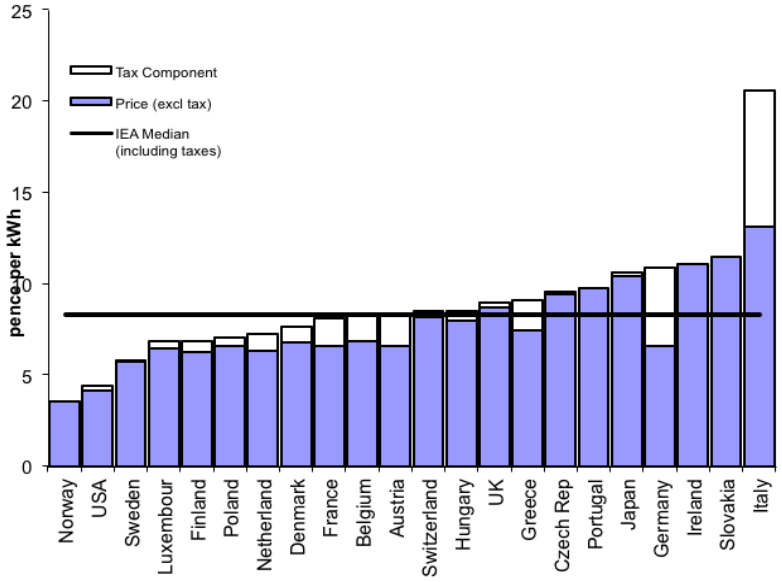
Source: Neuhoff, K. et. al., Staying with the leaders. Europe's path to a successful low carbon economy, Climate Strategies, 2014

FIGURE 14 ► EU gas consumption (right axis) and different gas prices (left axis)



Source: Aggregate data from Eurostat, BP Statistical Review

FIGURE 15 ► Average IEA industrial electricity prices in 2013 including taxes (pence / kWh)



Source: Aggregate data from Eurostat, BP Statistical Review

This period was also marked by a decline in fossil fuels production in the EU and the corresponding higher import dependency, and by a substantial disruption of Russian gas supply in January 2009 that hit a dozen of EU member states during winter.

FIGURE 16 ► Domestic productions of energy resources within the EU

DOMESTIC PRODUCTION 2012 IN 1000 TONNES OF OIL EQUIVALENT			
Total	Crude oil	Coal and lignite	Natural gas
369,615	70,413.2	166,053.3	133,148.5
DOMESTIC PRODUCTION 2002 IN 1000 TONNES OF OIL EQUIVALENT			
Total	Crude oil	Coal and lignite	Natural gas
566,766.4	151,374.4	209,420.4	205,971.6

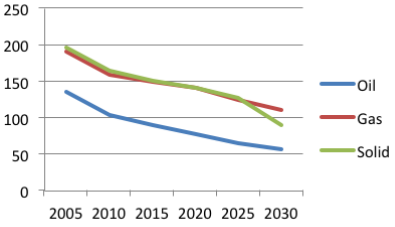
Source: Eurostat, 2014

FIGURE 17 ► The five biggest producers of oil, coal and gas in the EU in 2012

OIL		GAZ		COAL	
Country	Quantity in toe	Country	Quantity in 1000 toe	Country	Quantity in toe
UK	43,049,800	NL	57,472.4	PL	57,506,800
DK	10,168,700	UK	35,040.9	DE	47,596,300
IT	5,490,800	DE	9,568.8	CZ	20,141,500
RO	3,957,800	RO	8,682.7	UK	9,530,900
DE	2,576,000	IT	7,047.5	GR	8,044,700

Source: Eurostat, 2014

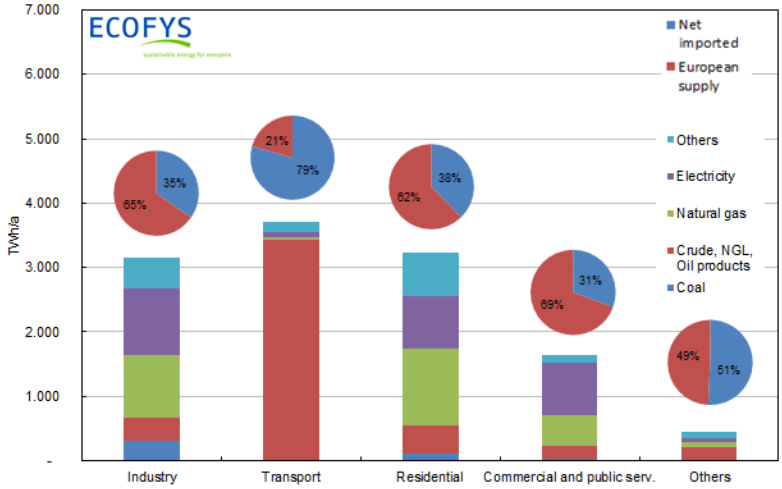
FIGURE 18 ► Indigenous EU fossil fuel production (left) and increasing import dependency (right)



IMPORT DEPENDENCY SCENARIO	2010	2020	2030
PRIMES 2030 policy framework	68.19%	71.39%	77.96%
IEA projections (new policies scenario)	67.51%	72.3%	78.39%

Source: European Commission, EU Energy - Transport and GHG emissions - Trends to 2050 - Reference Scenario Annex 2, 2014

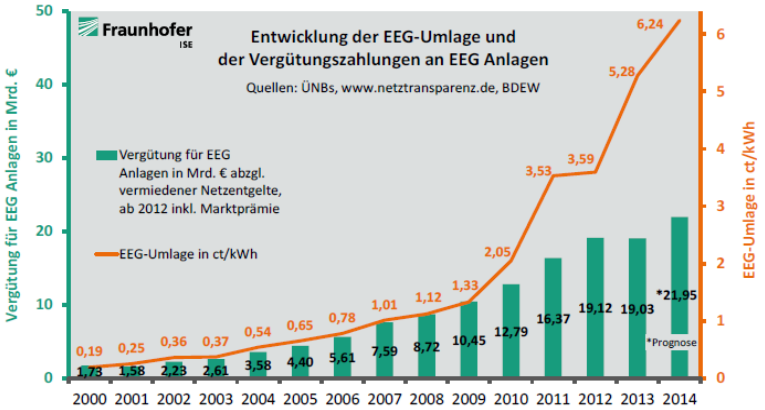
FIGURE 19 ► Final energy consumption by sector and carrier, combined with import dependency



Source: Ecofys, Deep renovation of buildings - An effective way to decrease Europe's energy import dependency, 2014

Then occurred Fukushima and the renewed doubts about the safety of the nuclear sector. The subsequent unilateral decision of Germany to phase out its nuclear power plants had a major impact on the EU and its internal energy market, showing at the same time that such a decision could not have been taken without the existence of the European market and the interconnections between the member states.

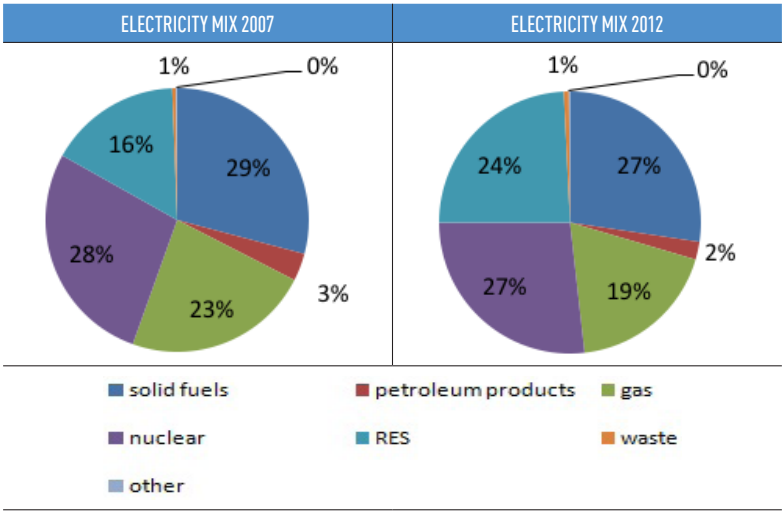
FIGURE 20 ► Evolution of German renewable energy surcharge (EEG Umlage)



Source: Fraunhofer, ISE, 2014

It is not an isolated case, as it reflects the general insufficient consideration paid by all EU member states to the impacts of national decisions on other countries and the limits of the national choices related to the energy mix in a European market. This unilateral approach, which expanded in a wide range of areas, including subsidies, security of supply, regional cooperation, and transparency deeply undermined confidence between EU member states and their ability to work together.

FIGURE 21 ► EU electricity generation per source



Source: Eurostat, 2014

FIGURE 22 ► Top 5 energy consumers in Mtoe (percentage of total EU consumption in parenthesis)

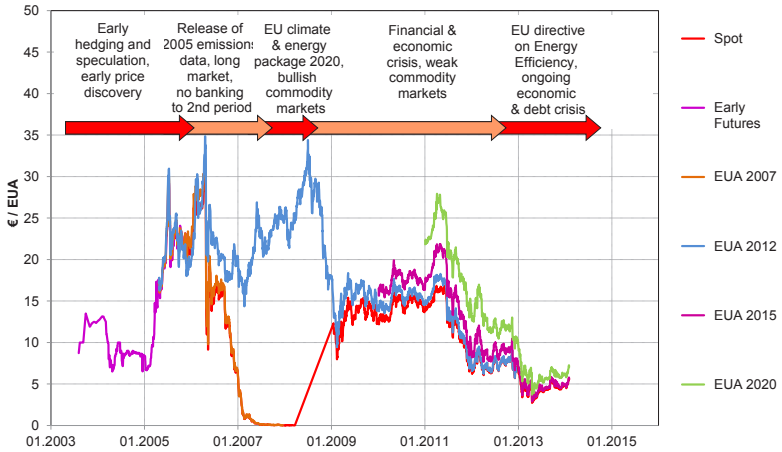
TOTAL ENERGY CONSUMPTION	PETROLEUM PRODUCTS	GAS	SOLID FUELS	NUCLEAR HEAT	RES
DE: 319.5 (19%)	DE: 108 (19%)	DE: 69.8 (18%)	DE: 80.3 (27%)	FR: 109.7 (48%)	DE: 33.1 (18%)
FR: 258.4 (15%)	FR: 80.4 (14%)	UK: 66.4 (17%)	PL: 50.6 (17%)	DE: 25.6 (11%)	FR: 21.1 (11.4%
UK: 202.3 (12%)	UK: 68.7 (12%)	IT: 61.3 (15.6%)	UK: 38.8 (13%)	UK: 18.1 (8%)	IT: 20.7 (11%)
IT: 163.1 (9.7%)	IT: 59.9 (10.5%)	FR: 38.2 (10%)	CZ: 17.2 (6%)	SE: 16.5 (7%)	SE: 18.5 (10%)
ES: 127.3 (7.5%)	ES: 52.9 (9%)	NL: 33 (8.4%)	IT: 16.3 (5.5%)	ES: 15.8 (6.9%)	ES: 15.9 (8.6%)

Source: Eurostat, 2014

Lastly, carbon prices have sunk very low, together with the EU-ETS, due to:

- the oversupply allowance of international credits under the EU-ETS, which represents around half of the current surplus of allocations,
- the reduction of emissions caused by the economic slowdown, in contrast to a trend-growth projection of economic and emissions development that has not materialised,
- the improvement of energy efficiency,
- the phasing out of old and most carbon intensive (fuel-burn) power plants from electricity generation market, and
- the expansion of RES.

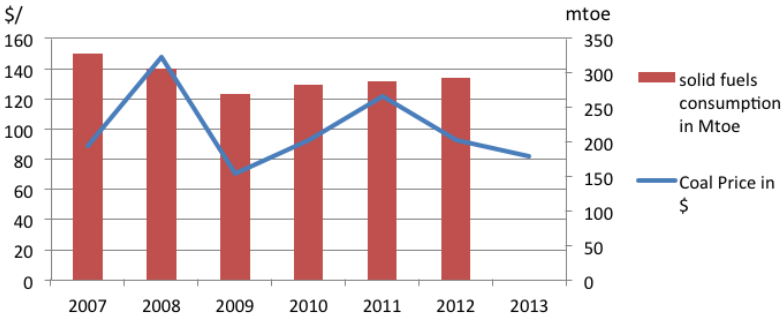
FIGURE 23 ► Development of the ETS allowance price



Source: Matthes, F. C. et. al., Öko-Institute.V.,Next Steps for the European Union Emissions Trading Scheme (EU ETS): Structural Reforms, 2014

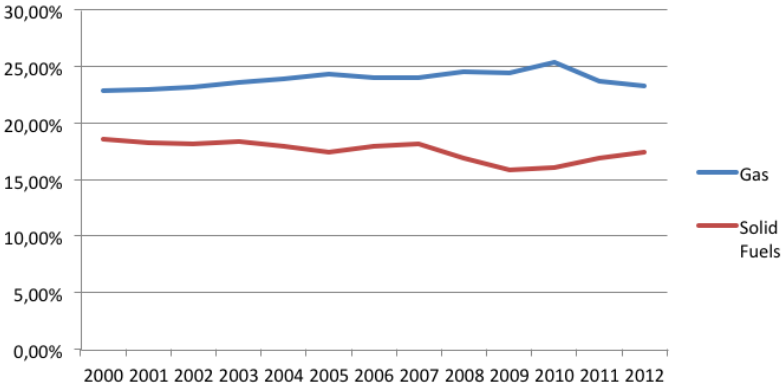
This carbon market depression has removed an incidental market incentive for new clean technologies (new RES or Carbon Capture and Storage for instance) – reflecting the EU-ETS primary purpose which was to reduce emissions, and its design, which was not to drive change in generation markets. It also came with unexpected resurgence of the EU continental coal-burn, encouraged by low coal prices bringing US coal, displaced by shale gas, to Europe.

FIGURE 24 ► Coal price per tonne (left axis) and EU solid fuels consumption (right axis)



Source: Aggregate data from Eurostat, BP Statistical Review, 2014

FIGURE 25 ► Gas and solid fuels consumption in the EU as part of gross inland consumption

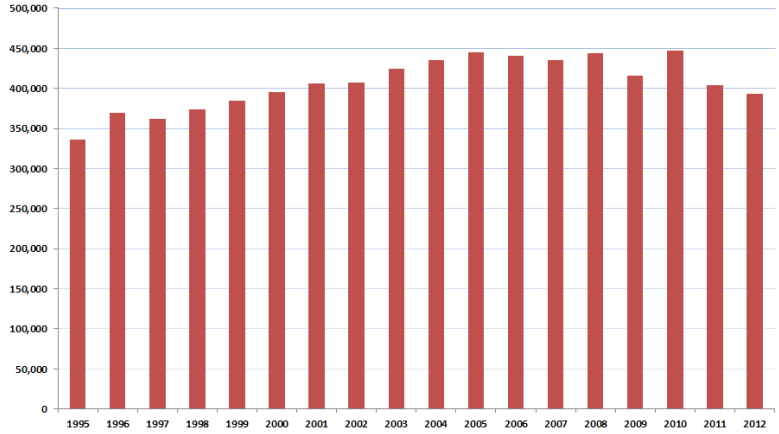


Source: Eurostat, 2014

As a result, utilities, which have decided to invest in gas assets around this period and ignored for too long the paradigm shift in electricity generation (GHG, RES, demand response) have suffered a lot from this combination of market, regulatory and political developments within and outside the EU. Some of the utilities have lost up to half of their stock exchange value, and have

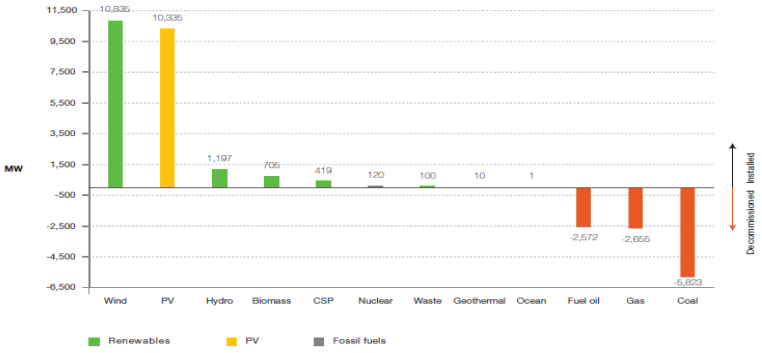
shutdown and/or mothballed several conventional gas power plants in the EU with up to 50GW capacities in total. Criticism by these companies has grown over the way that EU and national energy policies have developed, as illustrated by the Magritte initiative of major energy utilities since December 2013.

FIGURE 26 ► Evolution of European gas demand



Source: European Commission, SWD (2014) 330 final, 2014

FIGURE 27 ► Net power capacity added in the EU28 in 2013



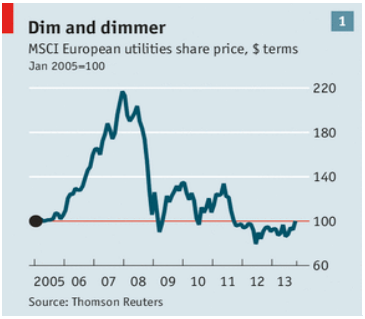
Source: EPIA, Global Market Outlook for Photovoltaics 2014-2018, 2014

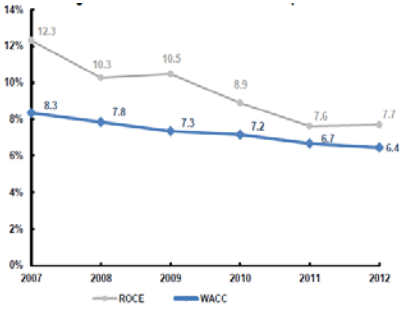
FIGURE 28 ► Drop of gas in power generation in selected countries

	2008	2009	2010	2011	2012	2013	H1 2014	H1 2014/H1 2013
Italy	33.4	28.7	29.8	27.5	24.2	20.1	7.9	-16%
UK	24.8	23.1	25.3	19.5	13.2	13.1	6.4	-8%
Spain	16	13.7	11.6	9.4	7.2	4.8	1.8	-12%
Belgium	n.a.	n.a.	n.a.	7.1	8.4	7.4	3.0	-32%
France	n.a.	n.a.	2.2	2.5	1.5	1.2	0.2	-73%

Source: European Commission, Gas Market Quarterly, 2014

FIGURE 29 ► Value loss of European utilities (left), ROCE and WACE of European utilities (right)





Source: The Economist, How to lose half a trillion Euros, 2014 (left)
Source: IHS CERA, European Energy Investment Imperative – Complimentary Report, 2014 (right)

Altogether, the collapse of the price of carbon, the fast increase of decentralised and centralised RES boosted by national support schemes, the impact of energy mix changes on neighbouring countries, the insufficient development of the grids in parallel of increasing power generation from RES, the comeback of coal and lignite, and finally the low energy price signals for new investments have deeply impacted the evolution of the EU internal energy market, thereby limiting its benefits.

1.3. Updating the energy framework: the 2030 EU energy and climate package

The rapidly changing European energy context, characterised by the uncertainty of regulatory frameworks, the lack of predictability to invest in low-carbon technologies, increasing prices, external dependency and growing concern over a loss of competitiveness have jolted the EU into adopting a new comprehensive Energy and Climate Package for 2030 in October 2014. First and foremost, the European Council has endorsed again the 2007 ambitions for 2020 and committed itself to "*the attainment of the EU targets for greenhouse gas emissions reduction, renewable energy and energy efficiency, which need to be fully met by 2020*".

The adopted new Energy and Climate Package for 2030 sets a range of quantified objectives related to climate and energy policies with : a binding EU target of at least 40% cut in greenhouse gas emissions with binding national objectives; a binding EU target of at least 27% in renewable energy with non-binding national action plans/objectives; an indicative energy efficiency target of at least 27% with non-binding national action plans/objectives and a prioritisation of certain sectors; and an indicative target of 15% of electricity interconnections in order to integrate remaining energy islands in the internal market.

This is a minimal achievement in setting the framework for the transition towards a low carbon economy, and for strengthening the EU position for the post-Kyoto negotiation at the COP21 conference in Paris in December 2015. However, the package remains elusive regarding its concrete implementation and the measures that need to be adopted. In addition, it raises many interrogations about the ability to reach the objective set for 2050 of 80-95% reduction of greenhouse gas emissions in the EU.

Consensus-based and technologically neutral, it is a mere continuation of the 2020 Package, based more or less on the same sets of objectives and methodologies, but with revised features. The increased flexibility given to member states is deemed to be accompanied by a reliable and transparent governance system aimed at facilitating coordination of national energy policies and fostering regional cooperation between member states.

However, the Package does not provide any clear indication on how to proceed. While the adoption of the 2030 Package is a valuable step in the development of a common energy policy for Europe, the addition of common targets/objectives adopted at EU level does not make it a fully-fledged European energy policy. Their implementation, which has been so far largely national in scope and action, remains the most important and difficult part of the process.

The European Council has also called for a further integration of variable RES into the market, a more interconnected internal energy market and appropriate back up which should be coordinated as necessary at regional level. However, the Council is not clear on how to do it, and whether there is a need for additional legislative measures or regulatory frameworks in these areas. The EU-ETS will be revised with a market stability reserve from 2021 onwards, but with no major change in the way that it is articulated (free allocation, carbon leakage, and so on).

Meanwhile, certain structural problems are still without an answer, most notably issues related to the current electricity market design, the concerns over the security of electricity supply, or the development of smart and interactive networks to allow for improved management both of the system and of demand.

The package also addresses the issues related to energy security and the external dimension of EU energy policy by putting emphasis on key infrastructure projects (PCI for diversification of gas suppliers/transit, integration of EU gas market, storage, ICT, etc.). It also addresses in very general terms the EU bargaining power in energy negotiations and the involvement of the Commission, the Energy Community in the EU neighbourhood, and conveying consistent messages to external partners.

Last but not least, the European Council has committed itself to keep all the elements of the EU energy framework under review, to continue to give strategic orientations, and to ask the Commission to continue to have a regular dialogue with stakeholders, which are three essential conditions for making future progress towards a common European energy policy. Finally, the European Council endorsed the Energy Union concept as its ultimate goal, without giving any idea of its content.

2. Critical assessment of European energy policy's strengths and weaknesses: 30 findings

Before designing any corrective measures or new action, it is wise to have a clear and common understanding of the causes that justify them. The 2007 "New Energy Policy for Europe" and the way it has been implemented by EU member states and energy stakeholders has had a major influence on the transformation of energy markets and systems across Europe, of which some are quite welcome and some are much more problematic. The present critical assessment is structured around three main areas: (1) the EU internal energy market, (2) the implementation of the 2020 Energy and Climate Package, and (3) the external dimension of European energy policy. It suggests 30 main findings.

2.1. The good but insufficient performance of the EU internal energy market

Finding 1. The enlargement of the European Union has been (and remains) a tremendous challenge

The enlargement of the European Union in 2004 and 2007 to new member states characterised by a more fossil fuels based energy mix than the others and higher dependency on a single supplier, Russia, was simultaneously a major game changer and a challenge for the whole EU. Their acceptance of the 20-20-20 objectives was a tremendous challenge, and they made significant efforts to cope with them and become part of the internal market.

However, the enlargement has not been accompanied by a sufficient improvement of the governance in several countries, either in their implementation of EU rules or through the necessary independent regulatory bodies. As a consequence, the benefits of the internal market have not always been reaped

and a certain fracture between Eastern and Western Europe remains in the field of energy. This is well illustrated by the different energy prices between Western and Central, Eastern and South-Eastern European countries, where high dependency on one single gas supplier prevails and where integration of energy markets is lacking.

FIGURE 30 ► Gas price differentials in Eastern and Western Europe, first half 2014

WHOLESALE WEST IN €/MWH		WHOLESALE EAST IN €/MWH	
Portugal	26.30	Czech Republic	27.81
Spain	31.72	Slovakia	28.40
France	31.79	Hungary	27.47
UK	21.80	Poland	22.22
Belgium	21.57	Estonia	31.32
Netherlands	21.58	Latvia	28.86
Germany	21.81	Lithuania	35.20
Austria	22.55	Romania	26.30
Italy	23.15	Bulgaria	29.96
Average	27.69	Average	28.62
AVERAGE GAS PRICE INDUSTRIAL CONSUMERS (controlled for Purchasing Power Standard and including levies and taxes)		AVERAGE GAS PRICE INDUSTRIAL CONSUMERS (controlled for Purchasing Power Standard and including levies and taxes)	
€40.95/MWh Lowest price: UK (€32.6/MWh) Highest price: PT (€52.3/MWH)		**€70.32/MWh** Lowest price: EE (€52.7/MWh) Highest price: HU (€93.6/MWH)	

Source: Aggregated data from European Commission and Eurostat, 2013

FIGURE 31 ► Electricity price differentials in Eastern and Western Europe, first half of 2014

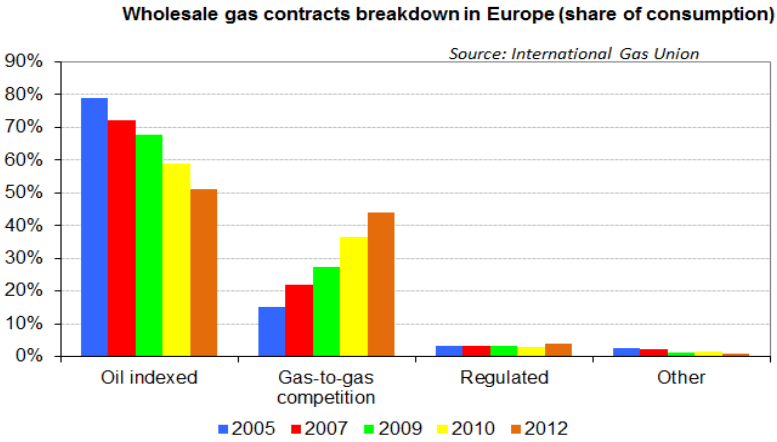
WHOLESALE BASELOAD WEST IN €/MWH		WHOLESALE BASELOAD EAST IN €/MWH	
Portugal	32.2	Czech Republic	32.7
Spain	33.3	Slovakia	33.4
France	34.7	Hungary	38.3
UK	51.8	Poland	44.6
Belgium	38.9	Estonia	35.3
Netherlands	40.9	Latvia	46.3
Germany	32.5	Lithuania	46.3
Austria	32.6	Romania	32.2
Italy	49.5	Bulgaria	No data
Average	38.5	Average	38.6
AVERAGE ELECTRICITY PRICE INDUSTRIAL CONSUMERS (controlled for Purchasing Power Standard and including levies and taxes)		AVERAGE ELECTRICITY PRICE INDUSTRIAL CONSUMERS (controlled for Purchasing Power Standard and including levies and taxes)	
€147.2/MWh Lowest price: FR (€102.8/MWh) Highest price: DE (€198.5/MWH)		**€185.9/MWh** Lowest price: CZ (€153.2/MWh) Highest price: LT (€230.5/MWH)	

Source: Aggregate data from European Commission and Eurostat, 2014

Finding 2. Wholesale markets are working

The wholesale internal gas market has been working more adequately than the electricity one, thanks to the oversupply of gas due to the reduction of demand and to the increase of interconnections and LNG terminals enhancing the liquidity of European hubs. The evolution of European gas prices shows the impact of competition on prices but also reflects the lack of demand for gas in Europe.

FIGURE 32 ► Evolution of hub traded gas and oil indexed contracts



Source: European Commission, SWD 2014, 310, 2014

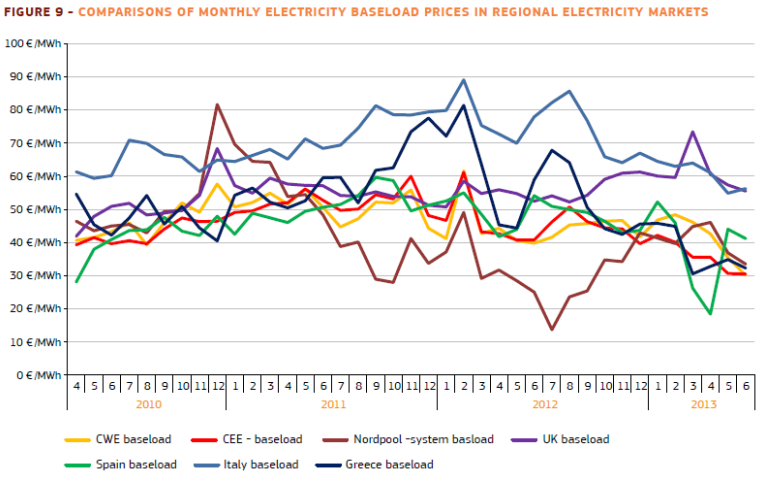
However, the historical oil indexed initial import price of gas and the classical structure of the related long-term contracts (take or pay clause) remain a major worry in Europe. Prices of gas in these contracts do not reflect the reality of the markets. Oligopolistic producers are restricting supply to support high prices and maintain their dominance on the markets. Hubs are still subject to price manipulations and are not liquid enough in particular as regards the second hand gas that both external suppliers and EU utilities (*midstreamer)* are selling from long-term take or pay supply contracts.

FIGURE 33 ► Evolution of gas prices on spot markets and gazprom prices

Source: The Economist, Paying the piper, 2014

Wholesale electricity markets performed relatively well as a result of the opening of the market. The 3rd Package facilitated unbundling, third party access and transparency as well as the integration of electricity and gas infrastructures, the deployment of RES, and the consumers to progressively choose freely their electricity and gas supplier(s). The massive injection of subsidised RES in the market enabled producing electricity with very low marginal costs and operational expenditures that have kept wholesale electricity prices relatively low. Negative prices have also occurred making a range of power plants unprofitable (including, gas, nuclear and others).

FIGURE 34 ► Comparison between different wholesale electricity prices



Source: European Commission, 2014

Finding 3. A welcome mobilisation of all players

The implementation of the internal market for electricity and gas mobilised all players to create common rules and to co-operate in order to enhance the functioning of the market. The European Council, with the active support of its President, devoted several meetings to the energy policy since 2007

demonstrating its importance and the need to give impetus from the very top level of decision makers.

More importantly, the incremental development of the internal market of electricity and gas in the last couple of years has been driven by a progressive cooperation of key stakeholders, including the incumbents i.e. regulators, transmission system and, to a lesser extent distribution system operators (TSOs-DSOs), suppliers, traders, power exchanges and customers in bodies such as the Madrid and Florence fora, the London Citizens' Forum and the Gas and Electricity Coordination Groups. They are the existing models of coordination between the European Commission, the EU member states and the energy sector, which have notably opened the way for the development of the Electricity and Gas Target Models.

Energy regulators further cooperate within the Agency for the cooperation of regulators (ACER). TSOs activities and cooperation at European level have reinforced substantially, with important players becoming transnational, and with ENTSO-E and ENTSOG enabling them to cooperate on essential technical issues and, not least, the generation adequacy and supply outlooks.

Finding 4. New model of governance such as co-regulation

New model of governance such as co-regulation between key stakeholders has facilitated the adoption of important instruments, like the Ten Year Network Development Plan (TYNDP), the Network Codes and the Projects of common interest. These are important tools to synchronise the generation and grid investments as well as to enhance security of supply and the optimisation of energy networks and resources. Other positive effects from this new governance have followed – namely, more transparency, interoperability, better monitoring of compliance with EU law, and increased cross-border trading of electricity and gas.

However, the decision-making process remains complex and slow with a still strong influence of the incumbents and national protectionist interests. The adoption of network codes takes at least two to three years so that they have to be updated as soon as they are adopted. The control of the EU member states is taking place at two different levels (ACER and Comitology), demonstrating

member states' reluctance in the process. The Gas and Electricity Coordination Groups are useful talk shops but not creative places where joint decisions can be taken, real time coordination organised or concrete measures be designed and implemented. ACER and ENTSO-E/G are not equipped with all the competences and resources required to fulfill their missions.

Whether ACER is responsible for taking individual decisions on specific cross-border issues and can additionally adopt non-binding guidelines, it is not empowered to adopt binding rules. As such, it is not a European regulator but more a platform of cooperation for the national regulators under the close supervision of the member states sitting in its Administrative Board and their National Regulatory Authorities sitting in the Board of Regulators.

Similarly, TSOs are not allowed to coordinate in real time the flows of electricity and gas while the transmission infrastructure would need to be managed by a body acting at European or at least at regional wide level in order to better combine the strengths and weaknesses of the different national energy resources and systems through a clever European use of the transmission system.

Finding 5. Regional cooperation has emerged but remains *ad hoc* and voluntary

Regional cooperation frameworks such as the regional initiatives of the regulators, intergovernmental platforms like the Pentalateral Forum and the Visegrad Initiative, or others like Nordpool have also been initiated to foster integration of Europe's electricity and gas markets with the most willing countries as a stepping stone towards a single EU energy market. In other cases, the market players have taken concrete steps with remarkable results such as the electricity day-ahead market coupling of Central West Europe (CWE) in 2014 and the PRISMA platform for transnational allocation of capacity in gas. The Baltic Energy Market Interconnection Plan (BEMIP) is a clear illustration of how regional cooperation can lead to operational decisions and concrete results such as key interconnectors being built improving regional integration and removing the isolation of the Baltic states, when there is a strong leadership from the European Commission and there are EU funds available to stimulate the identified investments needed.

FIGURE 35 ► **Coupled markets across the EU**

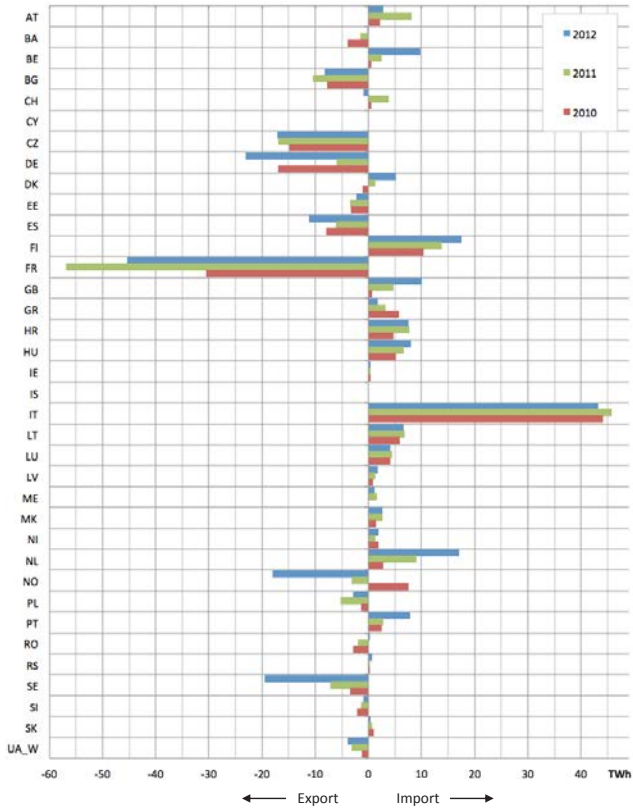
Source: EMCC, 2014

Regional initiatives have been disappointing and other regional cooperation frameworks have not been performing to their full extent, with large asymmetries from one region to the other. The fact that regional frameworks are currently voluntary is now reaching its limits since it can be stopped by any single member state at any moment for any reason (justified or not).

Finding 6. Progressive integration of networks is visible but can be accelerated

With the adoption of the 2013 Infrastructure Package, the EU has put stronger emphasis on the need to increase the physical integration and liquidity of the internal energy market through infrastructures such as transmission lines, interconnections, LNG terminals and storage facilities.

FIGURE 36 ► Physical exchange flows between European states, 2010–2012

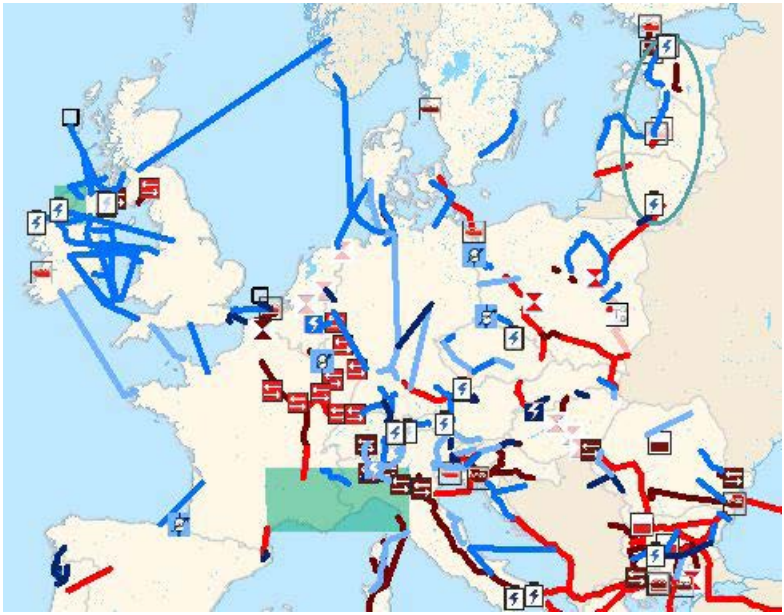


Source: ENTSO-E, Yearly Statistics & Adequacy Retrospect, 2012

The definition of projects of common interest (PCI) in a collective process with all parties concerned at regional level (EU member states, TSOs and regulators with the involvement of ENTSOs and ACER), and their benefits in terms of permit granting, cost allocation and financing are significant steps to achieve a well-integrated network. For the first time, EU member states have accepted to consider their own infrastructures in a regional context for the common interest of regions such as the Baltic Sea Basin (BEMIP), Central

Eastern Europe, North Western Europe, Northern Seas Offshore etc. The exercise of PCI identification has been a success, even if one may consider that 248 selected projects lack a sense of priority. The actual implementation of the Cross Border Cost Allocation (CBCA) and Cost Benefit Analysis (CBA) in the future will be the acid test of the validity of the process.

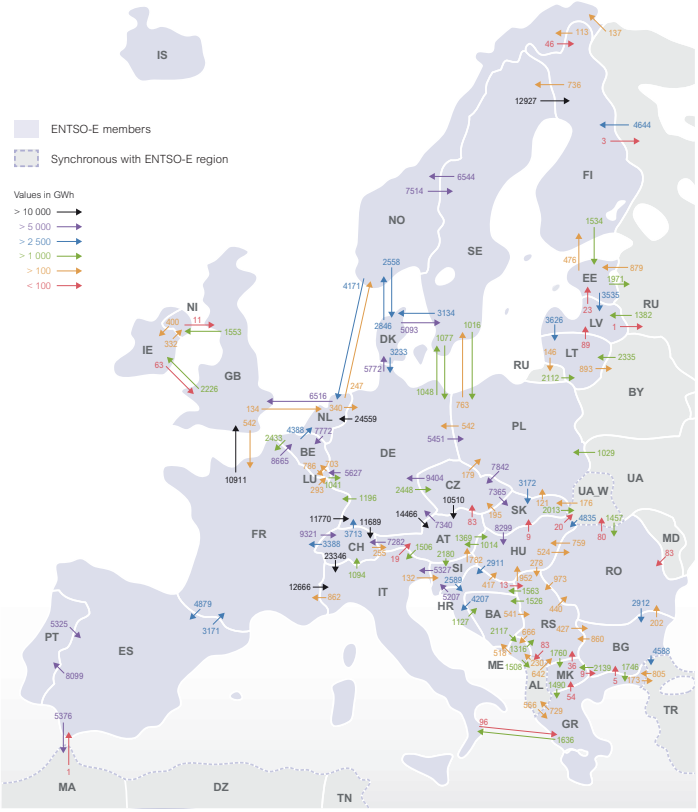
FIGURE 37 ► Projects of common interest to be realised until 2022



Source: European Commission (red: gas, blue: electricity), 2014

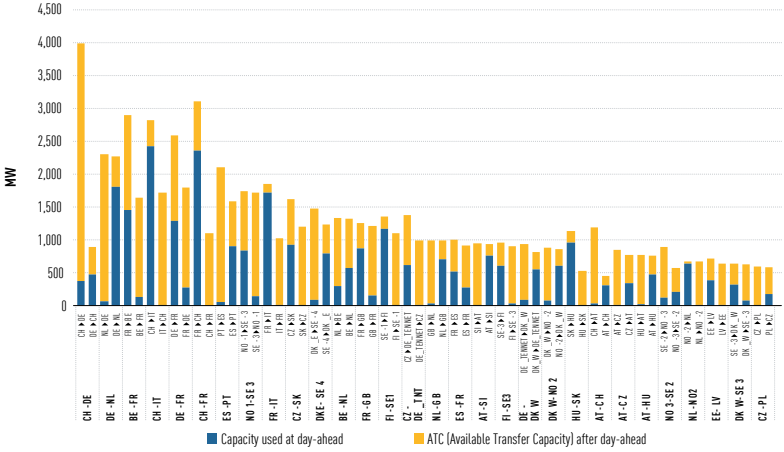
At the same time, the EU internal market in gas and electricity remains at the moment characterised by an insufficient level of interconnections in gas and electricity. This is translated by significant price differences and a waste of resources, as the lack of interconnection does not allow EU markets with overcapacity to match those with scarcer resources. Energy islands within the EU are still numerous, including key areas such as the Iberian Peninsula, the Baltic states, UK and Ireland.

FIGURE 38 ► Electricity interconnections in Europe



Source: ENTSO-E, Statistical Factsheet, 2013

FIGURE 39 ► Cross-border capacity available after gate closure on day-ahead markets on selected borders



Source: ACER/CEER, Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets, 2012

The Trans-European networks (TEN-E) provisions do not allow the EU to mandate direct action but only to facilitate national initiatives and as such are not capable of ensuring the achievement of cross border infrastructures. Infrastructures are still largely depending on the willingness of each EU member state to build them, as each keeps a veto right on such building. This may be particularly crucial in case of reversing the flows on gas pipelines to be implemented in one country for the benefit of another country or to remove electricity loop flows affecting several countries in Central Europe.

Finding 7. Security of electricity supply is not framed at European level

It remains as such the weakest element of the European energy system. The lack of a comprehensive EU regulatory framework for the security of the electricity system leaves this responsibility with the EU member states, thereby ignoring the reality of the European market. It leaves them to take national measures to ensure the generation adequacy only inside the borders of their country and to put in place capacity remuneration mechanisms and strategic

reserves tending to privilege one or another form of energy usually favouring the national operators and infrastructures.

FIGURE 40 ► Overview of capacity mechanisms in Europe

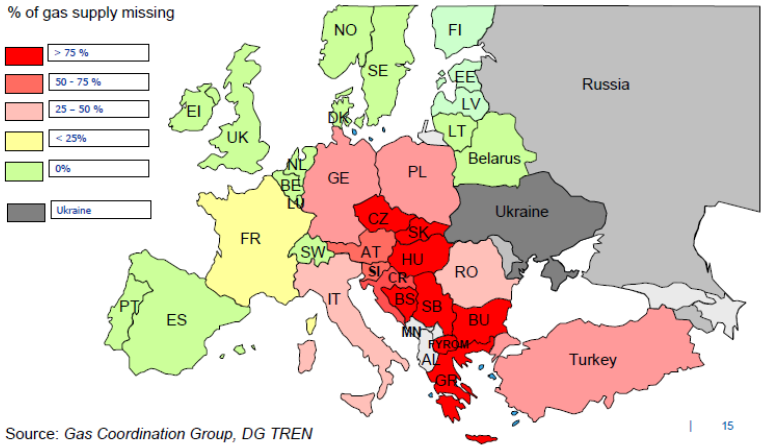
Source: Platts, 2014

At EU level, these measures and instruments are so far only subject to anti-trust and state aid rules. However, competition law and *ad hoc* derogations to internal market rules on a case by case basis are not appropriate to design a coherent energy policy and to provide a systemic and all-encompassing answer to structural market failures.

Finding 8. Security of gas supply is framed at European level but can be improved

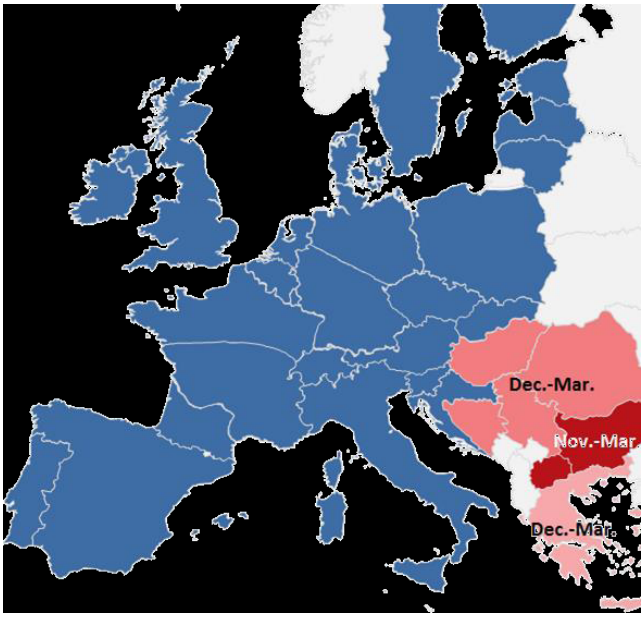
Following the gas supply disruption of January 2009, a comprehensive EU Regulation on security of gas supply was adopted, establishing common EU supply and infrastructure standards for the EU member states and a common EU framework requiring preventive action and emergency plans in case of supply disruption. The importance of reverse flows in the gas infrastructures and of connecting storages and LNG terminals to the network was recognised to improve security of supply. Such EU regulation has proven its usefulness as it provided the adequate EU framework and common rules that market operators should apply.

FIGURE 41 ► Unsatisfied gas demand in Europe caused by the Ukrainian gas crisis in 2009



Source: DG TREN, Gas Coordination Group, 2009

FIGURE 42 ► Member states (in red) which will be unable to meet all of their gas demand in case of prolonged (October 2014 to March 2015) gas supply disruption of the Ukraine route



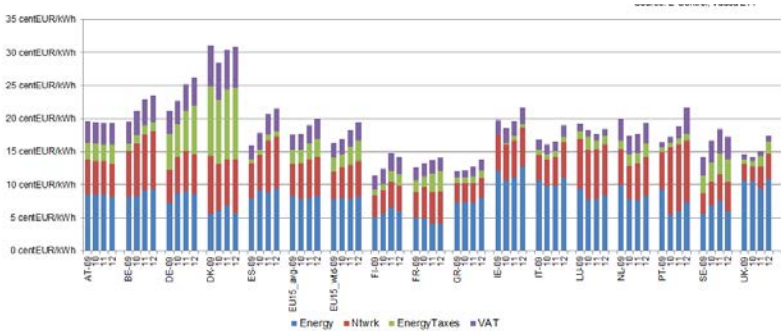
Source: ENTSOG (LEBOIS, O.), Winter Risk Assessment, 2014 (blue: no affect, pink: 20% demand-supply gap, light red: up to 40% gap, red: up to 60% gap)

This has allowed the industrial operators and utilities to play an important role in investing in the overhaul of gas transportation infrastructure and storage, and in developing reverse-flow on many pipelines. As the recent EU gas stress tests have illustrated, this has clearly improved the resilience of EU internal gas market and the security of supply and solidarity within the EU and between member states. But more can be done, as recently highlighted by the Commission's assessment of this Regulation.

Finding 9. Retail markets are not working satisfactorily

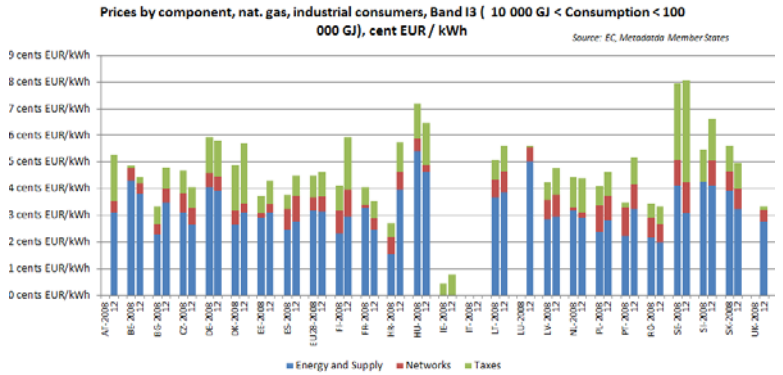
Retail markets remain to a large extent outside the European process. Prices are increasing everywhere, due to the addition of various elements not necessarily pertaining to electricity supply, as electricity bills are an easy opportunity to collect other non-transparent/relevant levies.

FIGURE 43 ► Retail electricity prices and their components (taxes, levies etc.) in different member states



Source: European Commission, Energy Prices and Costs Report SWD (2014) 20 final/2, 2014

FIGURE 44 ► Different amounts of taxation in the EU countries' gas prices for industrial consumers



Source: European Commission, Energy Prices and Costs Report SWD (2014) 20 final/2, 2014

Consumers (including those producing electricity on their own), industry, SMEs and households are not yet full players in the market. Switching rates remain low in several countries, especially where market concentration is high and/or where prices are regulated.

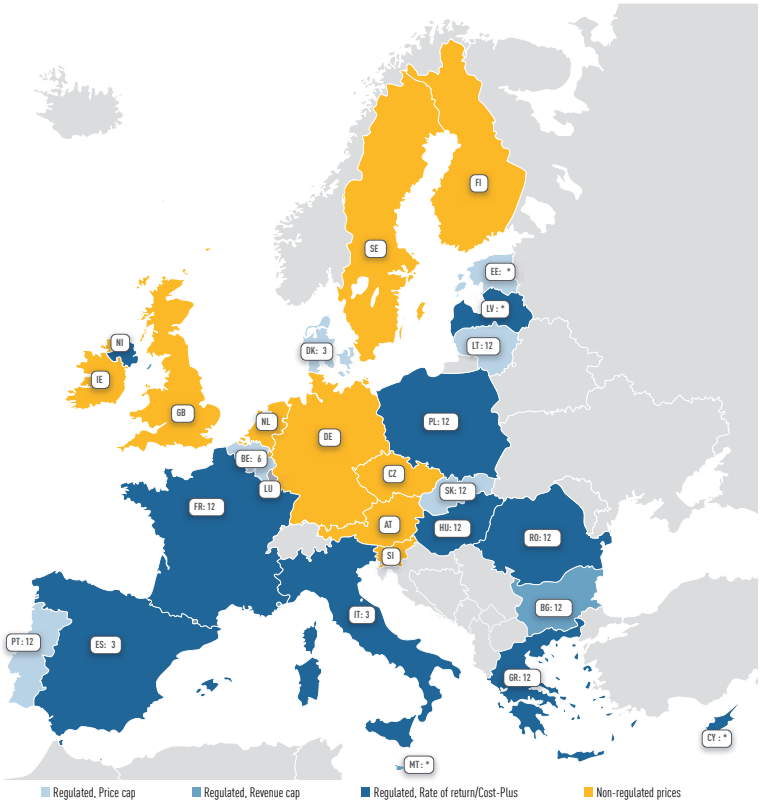
DSOs are not incentivised properly to make the system more dynamic. Close to real time pricing still does not exist. And effective smart meters giving clear price signals are still largely absent although many deployment plans are now coming to light.

FIGURE 45 ► Switching rates in retail electricity markets

Country	Switching rates 2012	Switching rates 2011	Difference 2012-2011
Portugal	13.2	1.1	12.1
Belgium*	14.8	9.7	5.1
Slovakia	5.0	1.4	3.6
The Netherlands**	12.6	9.7	2.9
Greece	4.0	1.8	2.2
Slovenia	5.9	4.0	1.9
Denmark	3.7	1.8	1.9
Norway	13.0	11.3	1.7
Spain	11.6	10.0	1.6
Hungary	1.6	0.3	1.3
Sweden	9.9	8.9	1.0
Italy	6.4	5.8	0.6
Czech Republic	7.6	7.4	0.2
Bulgaria*	0.0	0.0	0.0
Cyprus	0.0	0.0	0.0
Estonia	0.0	0.0	0.0
Germany	7.8	7.8	0.0
Latvia*	0.0	0.0	0.0
Lithuania	0.0	0.0	0.0
Northern Ireland*	2.0	3.0	0.0
Romania	0.0	0.0	0.0
Luxembourg	0.1	0.2	-0.1
France	3.6	3.9	-0.3
Austria	1.0	1.4	-0.4
Finland	7.5	8.6	-1.1
Great Britain	12.1	15.4	-3.3
Ireland	10.6	15.1	-4.5
Malta	NA	NA	
Poland	0.6	NA	

Source: ACER/CEER, Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012, 2013

FIGURE 46 ► Countries with electricity price regulations (blue)



Source: ACER/CEER, Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2012, 2013

Finding 10. No effective demand response management

The organisation of the retail market does not allow for an effective demand response management, which would be necessary for enhancing the new role and abilities of the consumers in an open market, as well as security of supply.

Although consumers, industry, SMEs and actors from the civil society are progressively structuring their representation and action, through organisations and bodies such as the London Citizens' Energy Forum, the covenant of mayors, smart cities initiatives and collective purchases of electricity by consumer associations or municipalities, the main actors involved in the process are not yet structured at the European level through a single effective and empowered body such as ENTSO-E/G.

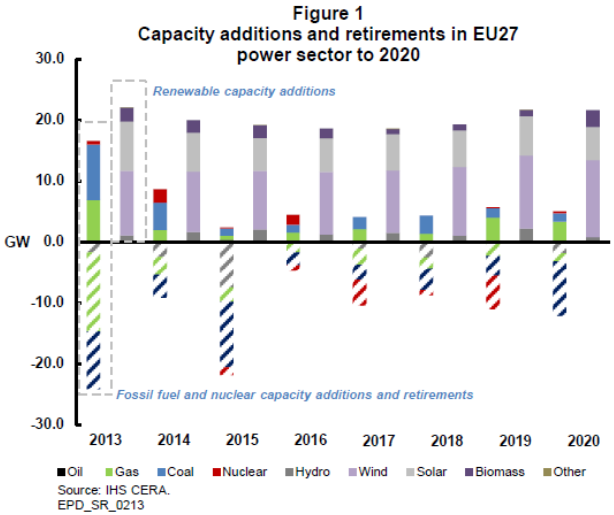
There are at least 4 associations of DSOs active at the EU level. The absence of adequate governance to address and promote the creation of competitive retail markets and the protection of consumer interests including data protection, shows the limited extent to which European consumers, and in some cases EU member states, understand how EU legislation protects their rights. Narrow vested interests should be replaced by policies that promote the interest of consumers and the achievement of efficiency and energy savings.

In addition, the existence of a few million prosumers in the EU reveals a new category of investors and producers of electricity which should be better involved in the system. Similarly, a number of local and regional organisations, including cities, are also becoming players to consider with the fast growing development of decentralised generation.

Finding 11. Electricity market design requires corrections

The lack of investments in conventional electricity generation and in cross-border infrastructures as well as the mothballing of Conventional Combined Cycle Gas Turbines power plants (CCGT - some of them almost new) is not only a result of the economic crisis and the reduction of demand but also of the failure of the existing electricity market design. The latter was not adapted to the decarbonisation of the energy systems both on the production side (massive deployment of subsidised RES), on the transmission side (flexibility of the grid) and on the demand side (intelligent management) especially when coping with peak demand and variable production. Unwelcomed loop flows have exacerbated the problems of the grid adaptation to the renewable injection.

FIGURE 47 ► Planned additions and retirements on the European electricity system until 2020



Source: IHS Cera, The European Energy Investment Imperative – Complimentary Report, 2014

The divergence and instability of national regulatory regimes have also made the climate for investment in the European energy sector very poor. As a consequence, the EU is not able to push for a wave of new technologies in the market. Overall, these shortcomings, mostly related to the inappropriate design of the electricity market in Europe and aggravated by the collapse of carbon price are now well identified but the right remedies have still to be invented.

Finding 12. Several national champions are becoming European and international players

Several national champions are becoming European players investing in production, transmission and distribution assets beyond their national borders. They also become international players investing in a globalised world where demand is growing and returns on investment may be more attractive than in Europe. Furthermore, some new companies are able to take advantage of the opportunities offered by the internal market to create new services.

FIGURE 48 ► Europe's largest oil and gas companies (exploration & production)

COMPANY	REVENUES IN 2013 (IN BILLION)	PEOPLE EMPLOYED	SHARE OF GOVERNMENT
Royal Dutch Shell	$ 451	92,000	0%
BP	$ 379.2	83,900	0%
Total	$ 227.9	98,799	0%
Eni	$ 152.7	75,206	30%
Repsol	$ 74.74	2,584	0%
OMV	$ 56.3	26,863	31.5%
PKN Orlen	$ 36	21,565	27.52%
MOL	$ 24.2	28,506	24.7%
Neste Oil	$ 23.2	5,097	50.1%
BG Group	$ 19.2	5,713	0%

Source: Aggregate data from companies' websites, 2014

FIGURE 49 ► Europe's largest utilities

COMPANY	REVENUES IN 2013	PEOPLE EMPLOYED	SHARE OF GOVERNMENT	INSTALLED CAPACITY (RES capacity in parenthesis)
E.ON	$ 162.6	62,239	0%	67 GW (9 GW)
GDF Suez	$ 118.6	147,400	36.7%	49 GW (Europe), (16 GW, world)
Enel	$ 106.3	71,394	31.24%	70 GW (11 GW)
EDF	$ 100.4	158,467	84.49%	140 GW (28 GW world)
RWE	$ 68.2	67,904	25%	51 GW (9 GW)
Iberdrola	$ 43.6	28,202	n/a	46 GW (27 GW)
EnBW	$ 27.3	19,774	+80%	13.4 GW (~3 GW)
Vattenfall	$ 23.8	30,544	100%	n/a
EDP	$ 21.4	n/a	0%	13.8 GW (6 GW world)
CEZ Group	$ 11.1	26, 746	70%	15.7 GW (2.7 GW)

Source: Aggregate data from companies' websites, 2014

However, EU member states are still pursuing individual industrial policies based on their main national energy companies, usually the incumbent, and markets remain concentrated to a large extent.

FIGURE 50 ► Market concentration in the EU electricity sector: market share of largest producer

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Belgium	92.3	91.1	92.6	93.4	92.0	87.7	85.0	82.3	83.9	80.0	77.7	79.1	70.7	65.8
Bulgaria**	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Czech Republic	71.0	69.2	69.9	70.9	73.2	73.1	72.0	73.5	74.2	72.9	73.7	73.0	68.0	68.0
Denmark	40.0	36.0	36.0	32.0	41.0	36.0	33.0	54.0	47.0	56.0	47.0	46.0	42.0	37.0
Germany**	28.1	34.0	29.0	28.0	32.0	28.4	31.0	31.0	30.0	30.0	26.0	28.4	:	:
Estonia	93.0	91.0	90.0	91.0	93.0	93.0	92.0	91.0	94.0	96.5	90.0	89.0	87.0	88.0
Ireland	97.0	97.0	96.6	88.0	85.0	83.0	71.0	51.1	48.0	45.6	37.0	34.0	38.0	55.0
Greece	98.0	97.0	98.0	100.0	100.0	97.0	97.0	94.6	91.6	91.6	91.8	85.1	:	77.0
Spain	51.8	42.4	43.8	41.2	39.1	36.0	35.0	31.0	31.0	22.2	32.9	24.0	23.5	23.8
France	93.8	90.2	90.0	90.0	89.5	90.2	89.1	88.7	88.0	87.3	87.3	86.5	86.0	86.0
Croatia	:	:	:	:	82.0	86.0	87.0	83.0	84.0	85.0	92.0	88.0	83.0	82.0
Italy	71.1	46.7	45.0	45.0	46.3	43.4	38.6	34.6	31.3	31.3	29.8	28.0	27.0	26.0
Cyprus	99.7	99.6	99.6	99.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Latvia	96.5	95.8	95.0	92.4	91.0	91.1	92.7	95.0	86.0	87.0	87.0	88.0	86.0	89.0
Lithuania	73.7	72.8	77.1	80.2	79.7	78.6	70.3	69.7	70.5	71.5	70.9	35.4	24.9	30.4
Luxembourg	:	:	:	:	80.9	80.9	:	:	:	:	:	85.4	82.0	81.8
Hungary	38.9	41.3	39.5	39.7	32.3	35.4	38.7	41.7	40.9	42.0	43.1	42.1	44.1	47.1
Malta	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Netherlands**	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Austria	21.4	32.6	34.4	:	:	:	:	:	:	:	:	:	55.3	56.6
Poland	20.8	19.5	19.8	19.5	19.2	18.5	18.5	17.3	16.5	18.9	18.1	17.4	17.8	16.4
Portugal	57.8	58.5	61.5	61.5	61.5	55.8	53.9	54.5	55.6	48.5	52.4	47.2	44.9	37.2
Romania	:	:	:	:	:	31.7	36.4	31.1	27.5	28.3	29.3	33.6	26.0	26.7
Slovenia	:	:	:	50.7	50.3	53.0	50.1	51.4	82.0	53.0	55.0	56.3	52.4	55.2
Slovakia	83.6	85.1	84.5	84.5	83.6	83.7	83.6	70.0	72.4	71.9	81.7	80.9	77.7	78.9
Finland	26.0	23.3	23.0	24.0	27.0	26.0	23.0	26.0	26.0	24.0	24.5	26.6	25.6	25.2
Sweden	52.8	49.5	48.5	49.0	46.0	47.0	47.0	45.0	45.0	45.2	44.0	42.0	41.0	44.0
United Kingdom	21.0	20.6	22.9	21.0	21.6	20.1	20.5	22.2	18.5	15.3	24.5	21.0	45.6	51.7
Norway	30.4	30.6	30.7	30.7	30.7	31.2	30.0	30.9	32.5	27.4	29.5	29.8	33.6	28.6
FYR of Macedonia	:	:	:	:	:	:	:	:	:	:	:	:	:	92.6
Serbia**													56.0	:
Turkey**	79.0	75.0	70.0	59.0	45.0	39.0	38.0	:	:	:	:	:	:	:

Note: due to statistical confidentiality, some countries do not provide individual market shares for individual electricity generators.
* Including contracted generation.
** Information not available
Source: Eurostat (online data code: nrg_ind_331a)

Source: Eurostat, 2014

FIGURE 51 ► Market concentration in the EU gas sector: market share of largest producer and/or importer

	2007	2008	2009	2010	2011	2012
Belgium*	77.6	80.4	79.4	70.0	80.4	:
Bulgaria	92.1	94.1	99.4	97.1	99.8	:
Czech Republic	95.0	89.8	89.9	72.6	64.0	87.4
Denmark*	100.0	100.0	:	:	:	:
Germany	:	:	36.1	:	27.1	30.1
Estonia	79.0	77.0	95.0	100.0	100.0	100.0
Ireland	28.0	30.7	42.9	36.3	28.6	42.3
Greece*	100.0	100.0	100.0	88.6	:	:
Spain	41.5	43.1	43.8	43.7	44.2	48.2
France	85.0	86.0	77.0	73.0	58.0	59.0
Croatia	100.0	100.0	87.0	72.0	75.0	60.8
Italy	67.9	62.7	47.9	41.3	42.8	47.1
Cyprus	:	:	:	:	:	:
Latvia	100.0	100.0	100.0	100.0	100.0	100.0
Lithuania	39.3	38.3	43.5	50.5	39.7	43.6
Luxembourg*	:	:	:	:	:	:
Hungary	70.2	66.1	41.3	32.6	47.3	32.9
Netherlands**	:	:	:	:	:	:
Austria*	:	:	:	:	:	:
Poland	95.9	96.2	96.1	96.8	96.9	94.8
Portugal	100.0	100.0	95.0	95.8	85.3	84.1
Romania	40.9	36.8	47.6	48.4	45.2	41.7
Slovenia	99.7	94.6	95.0	94.2	91.7	90.0
Slovakia	97.9	88.3	82.8	77.7	71.7	61.8
Finland	100.0	100.0	100.0	100.0	100.0	100.0
Sweden	100.0	:	100.0	52.0	100.0	100.0
United Kingdom	21.0	19.0	18.0	23.0	24.0	31.0
FYR of Macedonia	100.0	100.0	100.0	100.0	97.6	55.1
Serbia*	:	:	:	:	73.4	:
Turkey*	:	:	:	:	:	:

*Information not available
** Confidential data

Source: Eurostat (This data is not yet available in the Eurostat dissemination database)

Source: Eurostat, Natural gas market indicators, 2014

Finding 13. National interventions remain too obstructive

The implementation of the EU internal market rules has not been able to lead up to now to the expected convergence of national policies or the needed coherence between different national decisions. In recent years, the primacy of national energy independence and unilateralism, with a certain degree of protectionism, has expanded everywhere in Europe.

In the name of their sovereignty over their energy mix, their natural resources, their economic, social and fiscal policies, or their role to ensure security of supply for gas and electricity – EU member states have taken unilateral measures without discussing with their neighbours the consequences of such decisions or their possible involvement or assistance.

These unilateral national interventions in the energy markets, not coordinated at EU level, have been denounced by stakeholders as costly and creating major disruptions. They can directly affect the price of energy and of its transport, and can have serious distortive effects on cross-border exchanges, impeding competition and threatening the foundations of the internal market and its current level of integration. They also reflect a lack of confidence in the European process and in market forces.

While these experiences led to greater awareness of the need, and many subsequent calls, for more coordination, no solution has been found so far. And the cooperation tools between EU member states are not adequate either. The establishment of capacity remuneration mechanisms and strategic reserves, based on national considerations, is the most recent expression of the renationalisation of the energy policy and directly undermines the viability of the internal market.

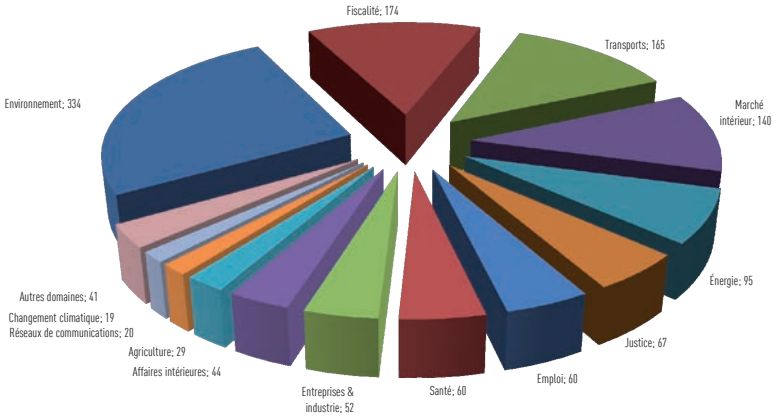
Finding 14. Lack of compliance is too frequent

Another striking feature of many recent EU energy measures (mainly communications including strategies and guidelines) is their facilitative or *a minima* nature, leaving policy formulation and implementation to the individual EU member states, who do so in divergent ways, which are neither harmonised nor coordinated at European level.

EU member states have also a poor track record when it comes to respecting and implementing the rules to which they have committed. The European Commission has been forced to launch an unprecedented number of enforcement actions to secure compliance with the successive packages of internal market Directives. This complicates the achievement of the internal market as the results will not be apparent for the several years it takes for their

resolution, or for the European Court of Justice to deliver a final judgment. This is not leading to a level playing field and may discourage the virtuous member states.

FIGURE 52 ► Overview of infringement procedures against member states in the EU by sector in 2013



Source: European Commission, Annual Report on Monitoring the Application of EU Law COM612 final, 2014

Finding 15. Lack of transparency, accuracy, and monitoring of national data

It remains very difficult to have a clear, updated and comprehensive view and analysis of market developments on an annual basis. There is a lack of transparency on the data available and the way they are collected and computed by national actors. Fresh comprehensive data are usually missing: the majority of EU documents adopted in late 2014 rely on Eurostat data from 2012, and/or to data collected by major private international organisations (IEA) and companies (BP, Exxon, Chevron and so on).

At the European level, the capacity of analysis, projection and modelling is weak and fragmented, especially when compared to what exists either at national or international levels. The Commission releases an increasing number of reports on a wide range of topics but they are never consolidated or articulated in a

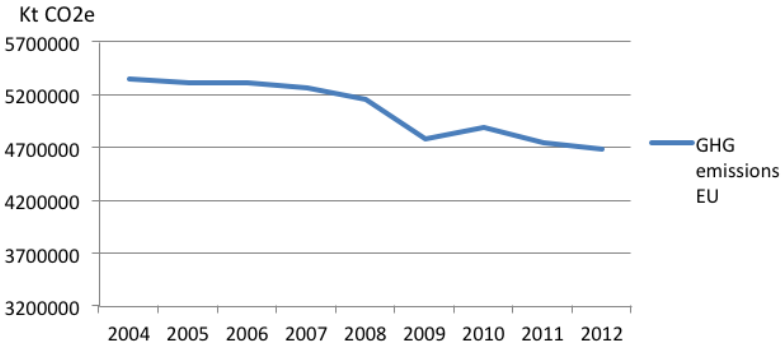
single comprehensive analysis. The interesting and useful practice of Strategic Energy Reviews has been abandoned since 2008 and the promised European Energy Observatory has never been created.

2.2. The implementation of the 20/20/20 objectives: on track but at what cost?

Finding 16. Greenhouse gas emissions reduction as expected

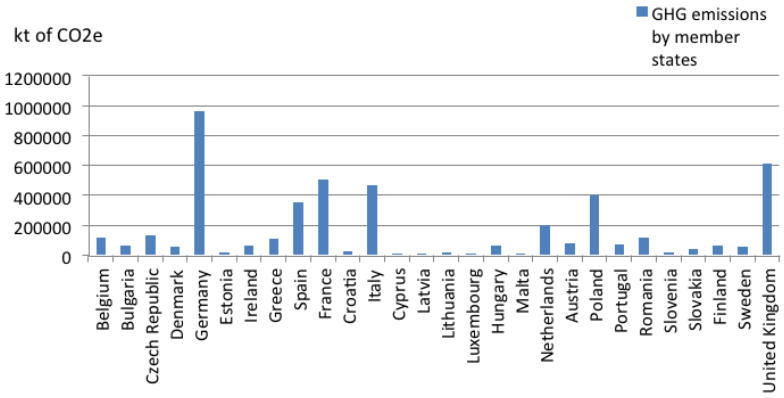
The EU is on track to meet its reduction of GHG emissions objectives by 2020 thanks to several combined factors: the economic slowdown reducing industrial emissions, the use of more renewable sources of energy instead of fossil fuels and the improvement of energy efficiency in industry and buildings. And probably too little is to be attributed to the ETS system designed to reduce greenhouse gas emissions including the energy sector. The EU carbon emissions trading system (EU-ETS) is not delivering the expected price signals for investing in low carbon technologies such as new RES and CCS. The EU-ETS is also further impacted by its overlapping and poor interaction with other energy policies and instruments such as RES and energy efficiency targets.

FIGURE 53 ► Evolution of EU28 greenhouse gas emissions (all sectors)



Source: Eurostat, 2014

FIGURE 54 ► GHG emissions in 2012 by member states in kt CO2e



Source: Eurostat, 2014

Finding 17. Renewable Energy Sources deployment more successful than anticipated but also more complex

The binding targets on RES created an unprecedented wave of investments in renewable sources of energy, mainly wind and solar, with a large number of new investors and new operators/entrants. The major increase of the installed capacity also brought a substantial reduction of the costs of these technologies allowing for their further deployment. The target of 20% will thus be met by 2020 and in electricity, the share of RES should be close to 30%. This is also due to the subsidies offered to them, coupled with the advantage of priority access to the grid granted by many member states.

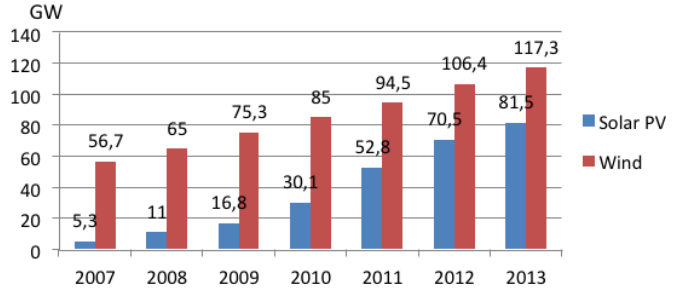
FIGURE 55 ► Member states progress in achieving the RES target

Annex I. Overview of Member States' progress

Member State	2005 RES share	2010 RES share	1st interim target	2020 RES target
Austria	23.3%	30.1%	25.4%	34%
Belgium	2.2%	5.4%	4.4%	13%
Bulgaria	9.4%	13.8%	10.7%	16%
Cyprus	2.9%	5.7%	4.9%	13%
Czech Republic	6.1%	9.4%	7.5%	13%
Germany	5.8%	11.0%	8.2%	18%
Denmark	17%	22.2%	19.6%	30%
Estonia	18%	24.3%	19.4%	25%
Greece	6.9%	9.7%	9.1%	18%
Spain	8.7%	13.8%	10.9%	20%
Finland	28.5%	33%	30.4%	38%
France	10.3%	13.5%	12.8%	23%
Hungary	4.3%	8.8%	6.0%	13%
Ireland	3.1%	5.8%	5.7%	16%
Italy	5.2%	10.4%	7.6%	17%
Lithuania	15%	19.7%	16.6%	23%
Luxembourg	0.9%	3%	2.9%	11%
Latvia	32.6%	32.6%	34.0%	40%
Malta	0%	0.4%	2.0%	10%
Netherlands	2.4%	3.8%	4.7%	14%
Poland	7.2%	9.5%	8.8%	15%
Portugal	20.5%	24.6%	22.6%	31%
Romania	17.8%	23.6%	19.0%	24%
Sweden	39.8%	49.1%	41.6%	49%
Slovenia	16.0%	19.9%	17.8%	25%
Slovakia	6.7%	9.8%	8.2%	14%
UK	1.3%	3.3%	4.0%	15%
EU	8.5%	**12.7%**	**10.7%**	**20%**

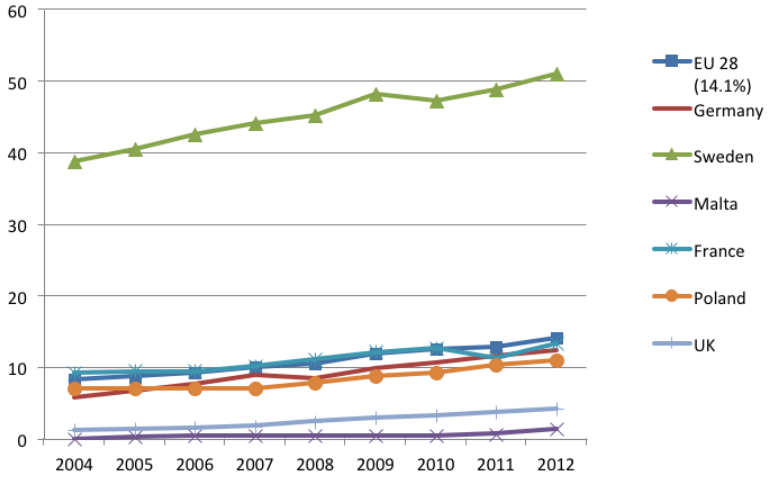
Source: EPIA, 2014

FIGURE 56 ► Cumulative solar PV and wind power installations in the EU, 2007–2013 in GW



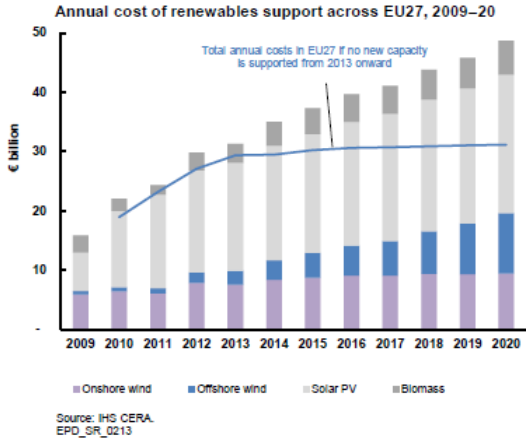
Source: Aggregate data from EPIA, EWEA, 2014

FIGURE 57 ► Evolution of RES share in gross final energy consumption in%, EU 28 and a selection of countries



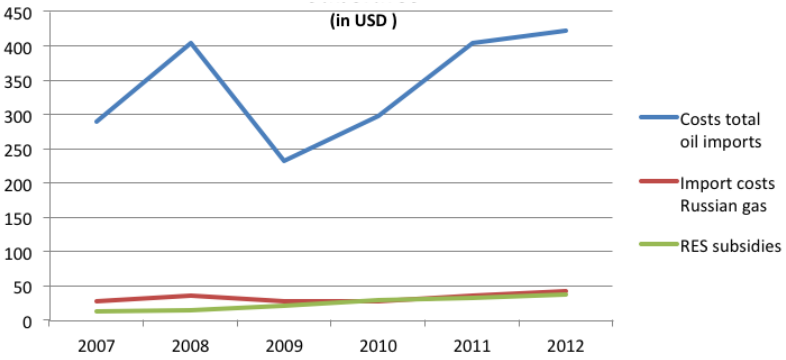
Source: Eurostat, 2014

FIGURE 58 ► RES support spending within the EU



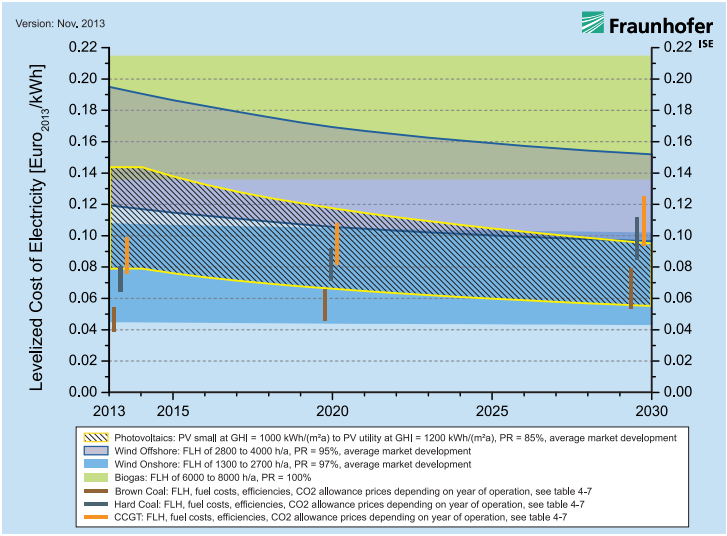
Source: IHS CERA, The European Energy Investment Imperative – Complimentary Report, 2014

FIGURE 59 ► Spending on oil and Russian gas imports as well as RES subsidies in $



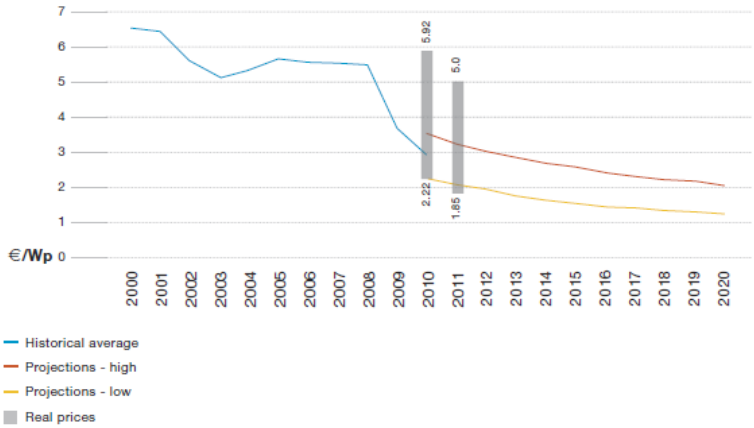
Source: Aggregate data from DG Energy, Ecofys, Gazprom, IHS Cera, Eurostat, 2014

FIGURE 60 ► Projected learning LCOE curve of RES generation compared to fossil fuel sources



Source: Fraunhofer Institut, Levelised Cost of Electricity Renewable Energy Technology, 2013

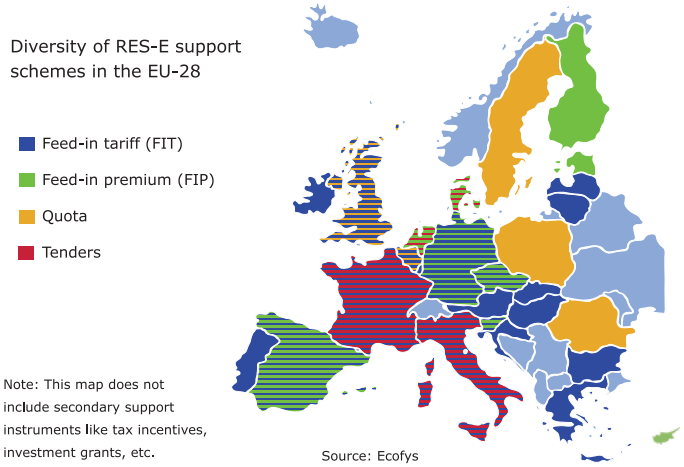
FIGURE 61 ► Cost evolution and outlook of solar PV installations



Source: EPIA, Solar Photovoltaics. Competing in the Energy Sector, 2012

However, as a result of national binding targets and quotas under the Renewable Directive, support schemes for RES have mainly remained national in scope and have not built on the desired cooperation between member states, with the notable exception of Norway and Sweden.

FIGURE 62 ► Different RES support schemes for RES installations across EU in beginning of 2014



Source: Klessmann, C., ECOFYS, Experience with renewable electricity (RES-E) support schemes in Europe, 2014

While needed and justified, they have also created important distortions, as RES do not bear the full cost of their use. Moreover, subsidised RES have provoked the increase of electricity retail prices in the countries which decided that the final consumers should bear the costs of the subsidies.

FIGURE 63 ► Evolution of RES support and electricity prices in selected member states

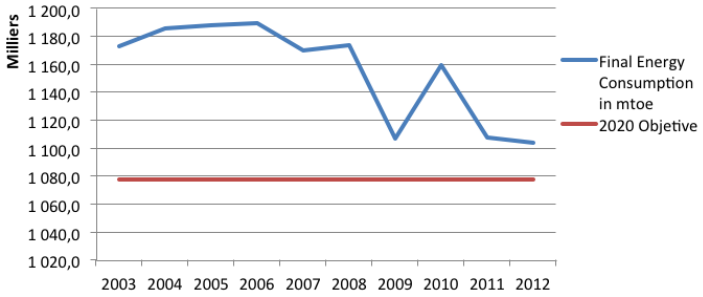
COUNTRY	% RES IN ELECTRICITY 2004	% RES IN ELECTRICITY 2012	RES SUPPORT IN 2007 IN MILLION €	RES SUPPORT IN 2012 IN MILLION €	2004 HOUSEHOLD RETAIL PRICES IN €/MWH	2012 HOUSEHOLD RETAIL PRICES IN €/MWH
PT	27.5	47.6 (+20.1)	104	< 500	€128.3	€110.5 (-14%)
ES	19	33.5 (+14.5)	942	8,100	€88.5	€176.6 (+99%)
DE	9.4	23.6 (+14.2)	3,564	15,820	€125.9	€144.1 (+14%)
IE	6.0	19.6 (+13.6)	13	47.5	€105.5	€185.0 (+75%)
IT	16.2	27.6 (+11.4)	1,752	~6,000	€143.4	€144.5 (+1%)
BE	2.4	11.1 (+8.7)	250	~ 900	€112	€159 (+42%)

Source: Aggregate data from Ecofys, Eurostat, online sources, ministerial homepages, 2014

Finding 18. Energy efficiency is now taken seriously but remains an underdeveloped objective

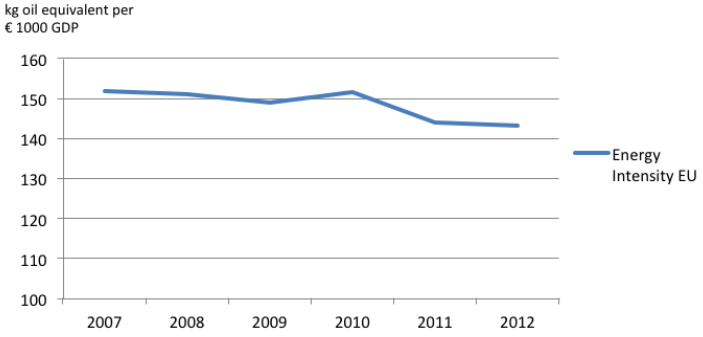
The awareness of energy efficiency has increased among all participants. Some innovative companies are able to offer new services on energy efficiency and demand response management. But energy efficiency remains a suboptimal area while it offers a huge potential for jobs and growth. According to the subsidiarity principle, EU member states claim that it is their own prerogative but at the same time they do not act without being pushed by EU measures and programmes through standards, building performance indicators and funds.

FIGURE 64 ► Evolution of final energy consumption in the EU and the 2020 objective



Source: Eurostat, 2014

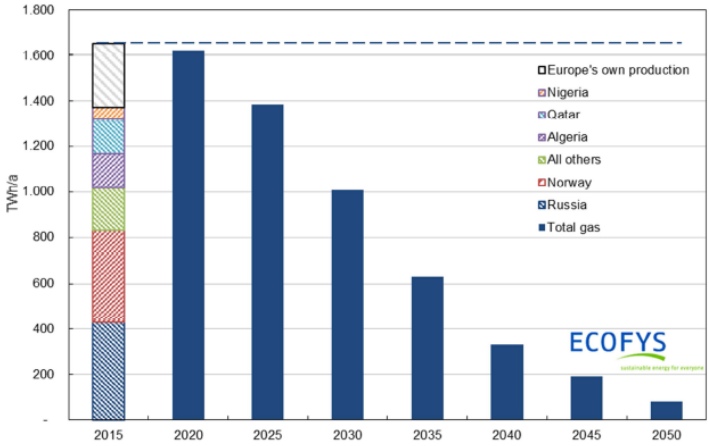
FIGURE 65 ► Energy intensity of the EU economy (kg of oil equivalent per 1000 GDP)



Source: Eurostat, 2014

The lack of aggressive approach to energy efficiency with accurate binding targets has prevented more savings of energy in both public and private sectors i.e. industry, SME's, buildings and households. Moreover, mobilising sufficient investments by public authorities and accessing these funds by all actors involved remain problematic, particularly in the building sector which represents more than 40% of the energy consumption.

FIGURE 66 ► Effects on comprehensive buildings renovation in the EU on gas imports



Source: Ecofys, Deep renovation of buildings. An effective way to decrease Europe's energy import dependency, 2014

Finding 19. Significant EU economic and financial instruments are geared towards the implementation of the 2020 strategy

Compared to the past, the EU started to make significant financing available to the energy sector, beginning with the 2010 European Energy Programme for Recovery. The new EU budget devoted to energy in the 2014-2020 multiannual financial framework includes important amounts (more than €35 Bn) for the financing of projects of common interest in the field of infrastructures (Connecting Europe Facility: €5,85 Bn), energy efficiency and renewable sources of energy (Structural funds : €23 Bn), and to research and development

(Horizon 2020: €6,6 Bn), in combination with other financial instruments such as those of the European Investment Bank or other specific funds such as the European Investment Fund and the Marguerite fund. The recent proposal of President Juncker to allocate €315 Bn namely to infrastructures should also bring new opportunities to finance investments in the energy sector.

FIGURE 67 ► Energy related financial support granted by the EU, 2014–2020

INSTRUMENT	YEARS	OBJECTIVE	BUDGET 2014 – 2020 IN € BILLION
Connecting Europe Facility (CEF)	2014–2020	Strengthening the European infrastructure	€5.85 billion for energy networks
Projects of Common Interest	2014–2020 (1st list adopted in 2014 but instrument is older)	Listing projects which strengthen the European energy infrastructure	Can benefit from CEF funding
European Structural and Investments Funds	2014–2020	Multiple, smart, inclusive growth and reducing divergence amongst member states in different policy fields	€23 billion have been ring fenced to "shift to low-carbon economy"
Horizon 2020	2014–2020	Strengthen the EU's position in the scientific and R & D sector	Overall budget: €79.4 billion, €6.6 billion will be dedicated to "energy efficiency, to smart cities and communities and to secure, clean and low carbon technologies"

Source: Aggregate data from European Commission, EU legal documents, 2014

FIGURE 68 ► Financial support instruments of the EIB for European energy projects

INSTRUMENT	INFORMATION	BUDGET/ASSETS AS OF 2013
European Energy Efficiency Fund	Support a sustainable energy market and climate protection	€145.8 million
Green Initiative	Support energy efficiency projects for SMEs	Offer preferable interest rates to SMEs
The Europe 2020 project bond initiative	Stimulate capital market financing of large European infrastructure projects	€230 million initial phase funding (till end of 2013) with expectation to leverage €4 billion, final evaluation expected in 2015

Source: Aggregate data from European Commission, EU legal documents, 2014

Finding 20. EU international ambitions in climate change are revised downwards

The EU's ambitions to lead by example in fighting climate change have not yet materialised. The successive international meetings since Copenhagen have been very disappointing and the economic crisis hitting Europe has limited the appetite to be a pioneer.

With less than 5% of global emissions in 2030, the EU might have further difficulties to remain a central player, and to convince the other large emitters which want to remain competitive without paying the price for emissions. The recent agreement reached by US and China, representing 40% of global emissions, is encouraging, but is not a guarantee that an international agreement may be reached at COP 21 in Paris in December 2015.

Finding 21. The competition on low carbon innovation might be won by others

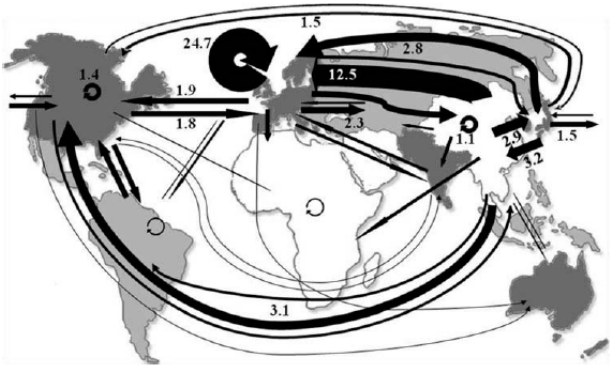
The EU has lost ground in becoming the world leader in clean/low carbon energy technologies, with increasing competition from emerging countries. The financial support to RES has so far gone to the large-scale deployment of almost mature technologies rather than for real innovation of immature key technologies. An important part of the components used for these new technologies are increasingly manufactured and imported from outside the EU. The energy sector has also been impacted in terms of new employment opportunities, but not necessarily as expected.

FIGURE 69 ► Solar PV market between 2008 and 2013

TOP SOLAR COMPANIES 2008 RANKED BY PRODUCTION			TOP SOLAR COMPANIES 2013 RANKED BY PRODUCTION			
Name	Country	Production in MW	Name	Country	Production in MW	Turnover (in € million)
Q-Cells	Germany	581.6	Yingli Green Energy	China	3234	1600
First Solar	US	504	Trina Solar	China	2580	1270
Suntech Power	China	495	Sharp	Japan	2100	1950
Sharp	Japan	473	First Solar	USA	2000	2420
JA Solar	China	300	Canadian Solar	Canada	1894	1650
Kyocera	Japan	290	Jinko Solar	China	1765	840
Yingli Green Energy	China	281.5	Hanwha Q Cells	Korea/ Germany	1280	560
Sun Power	US/ Philippines	237	JA Solar	China	1200	862
Trina Solar	China	210	Sun Power	USA	1134	1800
Gintech	Taiwan	180	Suntech Power	China	1750 (2012)	n/a

Source: EurobservER, Photovolatic Barometer, 2014

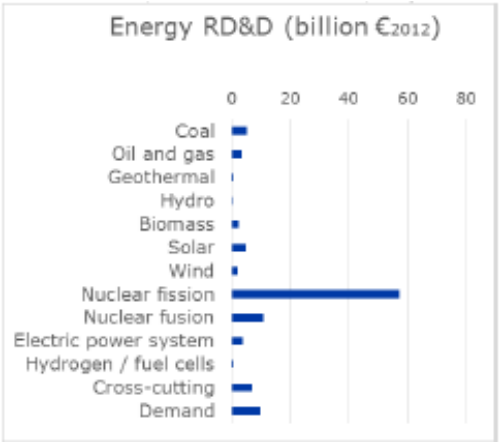
FIGURE 70 ► Trade flows of solar technologies in 2008



Source: Groba, F., Determinants of trade with solar energy technology components: Evidence of the Porter hypothesis?, DIW, Working Paper No. 1163, 2011

Overall, the EU does not have the authority to set guidelines for research and development activities and investments in the field of energy. The EU Strategic Energy Technology Plan (SET Plan) – towards a low carbon future – which aims at increasing R&D in both existing and new generations of low carbon technologies is an excellent initiative but it has neither found the corresponding financial incentives up to now, nor convinced the EU member states to make incentives available. Here again a lack of cooperation results in a waste of resources. The level of R&D expenditure by European energy companies and by member states has always been very low and fragmented at national level, compared to other industries. It should be seriously increased to address the low carbon economy challenge.

FIGURE 71 ► R&D expenditures per technology



Source: Ecofys, Subsidies and costs of EU energy. An interim report, 2014

FIGURE 72 ► Spending on all forms of energy in 2012 and over time

TYPE OF SUBSIDY	OIL	GAS	COAL	NUCLEAR	RES
Direct historic (1970 – 2007)	-	-	€200 bn	€220 bn	€100 bn
Other historic (1970 – 2007)	-	-	€380 bn	-	€70 – 150 bn
Total support in 2012	0	€5.1 bn	€10.1 bn	€6.9 bn	€40.8 bn

TOTAL SPENDING ON DIFFERENT ENERGIES IN 2012	
Spending energy demand (mostly on consumption of fossil fuels via tax rebates etc.)	€27.3 bn
Total spending on fossil fuel support (energy demand plus direct subsidies)	€34.5 bn
Total spending of EU 28 on energy subsidies	€99.3 bn

Source: Ecofys, Subsidies and costs of EU energy. An interim report, 2014

FIGURE 73 ► Total support provided in the 28 EU member states in billion € in 2012 and interventions by member states in million €

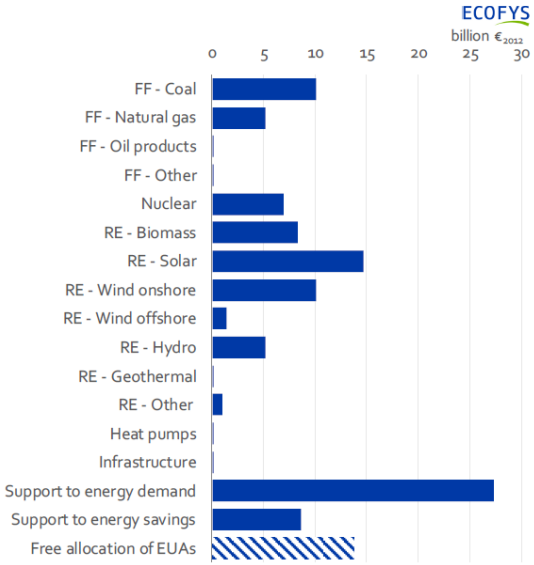
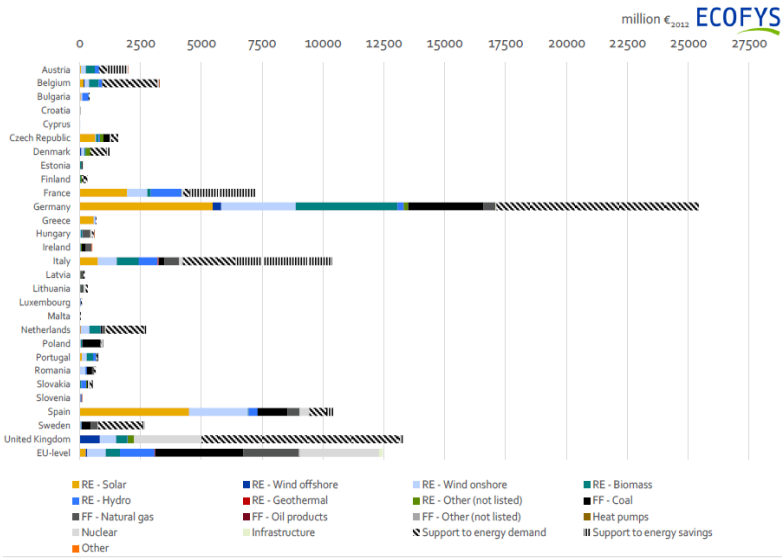
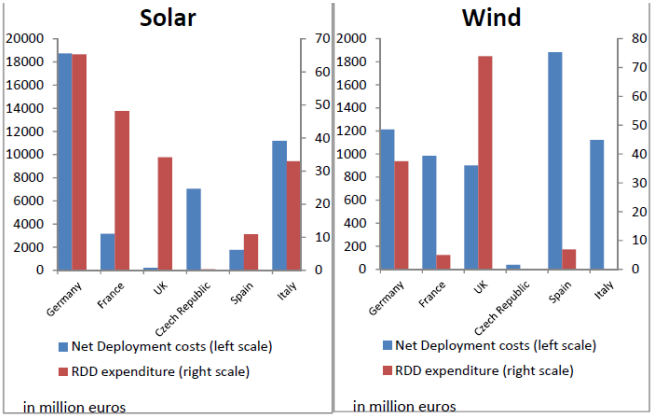


Figure S - 2 Total support provided in the 28 Member States (in billion €2012), including EU level support. Historic support is not included



Source: Ecofys, Subsidies and costs of EU energy. An interim report, 2014

FIGURE 74 ► RES: deployment expenditures vs. R&D expenditures in selected member states



Source: Zachmann, G. et. al., When and how to support Renewables, Letting the data speak, Bruegel, Working Paper 2014/01, 2014

Analysis: One can see that in analysed member states, spending on RES deployment (FiTs, grants, tax rebates etc.) is largely superior (sometimes by a factor of 400) to R&D expenditures

FIGURE 75 ► RES deployment costs in relation to R&D spending in selected countries

COUNTRY	SOLAR		WIND	
	Expenditures RES deployment (in € mio)	Percentage of R&D (amount in € mio)	Expenditures RES deployment (in € mio)	Percentage of R&D (amount in € mio)
DE	19,000	0.3% (65)	1,200	3.2% (38)
FR	3,000	1.7% (50)	1,000	0.5% (5)
UK	300	12.3% (37)	900	8.3% (75)
CZ	7,000	0.0% (1)	50	2.0% (1)
ES	1,000	1.0% (10)	1,900	0.4% (8)
IT	11,000	0.3% (33)	1,100	0.1% (1)

Source: Based on Zachmann, G. et. al., When and how to support Renewables, Letting the data speak, Bruegel, Working Paper 2014/01, 2014

Finding 22. Energy taxation remains fully national and is not used to meet the agreed EU objectives

Another less successful feature concerns taxation, which remains outside the scope of the EU energy policy. The EU does not have taxation powers which would allow it to discourage certain activities, to finance more efficient and sustainable alternatives, or to promote certain forms of (sustainable) energy use to the detriment of others. EU member states have never been able to agree (and go beyond the unanimity rule) on the revision and strengthening of the Directive on energy taxation after endless discussions.

2.3. The external dimension of EU energy policy emerged from the crises

Finding 23. Diversification of external supply sources, routes and counterparts is under way but not with sufficient determination

The EU has launched a strategy of diversification of gas sources and transit routes. The most visible European initiative has been to support the *Southern Gas Corridor* to bring Caspian gas resources to the EU, with *Nabucco* being the flagship project conceived as of genuine European interest and subject to clear international rules as it was governed by a Treaty between Turkey and the 4 EU member states concerned. It has overcome since its inception a number of uncertainties over supply, transit and investments, administrative obstacles, delays, rising costs, and fierce competition from other projects, including the Russian driven *South Stream* pipeline. As a result, the *Southern Gas Corridor* will not come on line in the form initially promoted but it will be first opened, hopefully in 2019-2020, with three successive pipelines subject to different jurisdictions: SCPX in Azerbaijan and Georgia, TANAP in Turkey and TAP in Greece, Albania and Italy.

FIGURE 76 ► Southern Gas Corridor: proposed projects

PROJECT NAME	START- / ENDPOINT	CAPACITY / ESTIMATED COSTS	SOURCE OF GAS	PROJECT PARTNERS	STATUS
Nabucco	Turkey - Austria	10 - 31 bcm/y €7.9 – 15 bn	Azerbaijan, (Iraq, Iran)	BOTAS, RWE, Bulgargaz, Transgaz, MOL, OMV	Abandoned
Nabucco West	Bulgaria/ Turkey - Austria	10 - 23 bcm/y Not specified	Azerbaijan	BEH, BOTAS, FGSZ, GDF Suez, Transgaz, OMV	Abandoned, although may resurface

TAP	Greece – Italy	10 – 20 bcm/y €1.5 – 3.9 bn	Azerbaijan	BP, SOCAR, Statoil, Fluxys, Total, E.ON, Axpo	Being implemented, expected to come on stream 2019
TANAP	Turkey/Georgia – Greece & Bulgaria	16 – 31 bcm/y ~ €7.4 bn	Azerbaijan	BOTAS, SOCAR	Being implemented, expected to come on stream 2019
TCGP	Turkmenistan – Azerbaijan	30 bcm/y ~ €3.7 bn	Turkmenistan	Not clear	On hold
White Stream	Azerbaijan – Romania	8 – 32 bcm/y €4.5 bn	Azerbaijan, Turkmenistan	White Steam Pipeline Company Ltd. (UK), GUEU (US)	Not clear
South Stream	Russia – Italy	63 bcm/y €19 – 24 bn	Russia	Gazprom, EDF, Wintershall, ENI	Suspended
Poseidon	Greece – Italy	8 bcm/y €500 mio.	Azerbaijan	Edison, DENA	Not clear

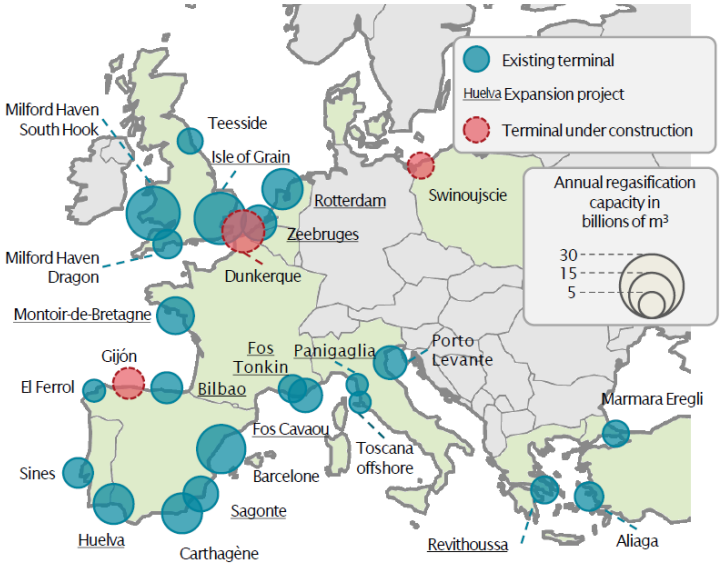
Source: Aggregate data from companies' websites, 2014

Important lessons can be drawn by the EU. Above all, it is not possible to develop such a project without sufficient assurances about the volumes of gas available and how suppliers (Azerbaijan, Turkmenistan, Iraq, East Med, and Iran) will engage. It is also difficult to develop a project of this magnitude when the companies and private operators involved are not among the largest in Europe and not directly involved in the production of the gas to be transported. Last but not least, the Southern Corridor, which was aimed to decrease key EU dependence on Russia and Gazprom, is potentially creating a new dependence on Azerbaijan, Georgia and Turkey, for both gas supply (*Shah Deniz II* gas field), gas transit (through SCPX, TANAP and TAP) and also for the EU gas infrastructure networks, starting with Greece and the acquisition of DESFA, the Greek gas TSO, by SOCAR, the Azeri oil and gas state monopoly. The legal and political complexity of a corridor comprising so many countries with very different

types of agreements between them and the EU is a real challenge that a genuine energy diplomacy could successfully tackle.

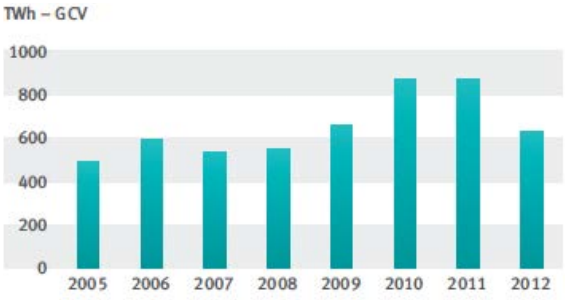
In concrete terms, the lion's share of the diversification of gas supply has so far been achieved by European energy industrial operators which have spearheaded several investment projects to develop the supply of liquefied natural gas (LNG) from a diversified range of external sources (Middle East, Qatar, Africa, North and South America, and potentially the United States) as well as additional pipelines to the EU.

FIGURE 77 ► Map of LNG terminals in the EU (2013 data)



Source: Gas in Focus, Existing and planned LNG terminals, 2014

FIGURE 78 ► LNG imports since 2005 within the EU



Source: BG Group, 2014

EU:

Spain:	14.2 mt
UK:	10.5 mt
France:	7.5 mt
Italy :	5.2 mt
Belgium :	1.9 mt

Outside the EU:

Japan:	87.3 mt
S. Korea:	36.8 mt
China:	14.8 mt
USA:	3.3 mt

FIGURE 79 ► Top 5 import partners for fossil fuels (percentages of total imports in parenthesis)

PETROLEUM PRODUCTS		GAS		SOLID FUELS	
2001	2012	2001	2012	2001	2012
Russia (23%)	Russia (31.4%)	Russia (38%)	Russia (36%)	South Africa (21%)	Russia (23%)
Norway (20%)	Norway (11%)	Norway (18%)	Norway (34%)	Australia (13%)	Colombia (21%)
Saudi Arabia (11%)	Saudi Arabia (9.4%)	Algeria (17%)	Algeria (14%)	Russia (10%)	USA (20.7%)
Libya (7.5%)	Libya (8.4%)	Other (4%)	Qatar (9%)	USA (9%)	Australia (6.7%)
Iran (5.4%)	Nigeria (8.3%)	Nigeria (2%)	Other (6%)	China (4%)	South Africa (5.6%)

Source: Eurostat, 2014

Finding 24. The external dimension of EU internal energy market is being progressively developed

Transparency in the field of energy has improved with the 2012 Intergovernmental Agreements (IGA) Decision which imposes on EU member states to share information between themselves and with the Commission on their agreements with third countries. Another further positive step, although not successful yet, has been the mandates granted to the European Commission to negotiate, in the name of the EU, agreements with Turkmenistan and Azerbaijan on the Trans Caspian pipeline, and with the Russian Federation on the Baltic states electricity organisation.

However, in spite of the greater EU international ambitions and objectives, endorsed in the successive EU Council conclusions (2007, 2011 and 2013) and most recently in the new 2014 EU energy security strategy, the international dimension of the European internal energy market is not promoted properly. Bilateral national deals with external energy suppliers continue to prevail over a comprehensive EU approach, making the EU an easy target for divide-and-rule policies by third-country suppliers and especially Russia.

They also undermine the strength of the internal energy market, preventing its effective projection into the international arena and opening the door to violation of the common rules by third country suppliers. For instance, the European Commission was required to help ensure compliance with the EU regulatory framework of the bilateral agreements over the Yamal pipeline negotiated between Russia and Poland on one hand, and on the other hand between Russia and Lithuania over the implementation of ownership unbundling in its gas sector.

But the most recent example of disunion is the South Stream gas pipeline promoted by the Russian Federation to circumvent Ukraine, to undermine the Southern gas corridor and to keep the Russian dominance over its traditional customers in Central and Eastern Europe as well as in South East Europe. The legal basis of this pipeline lays in the conclusion of intergovernmental agreements by several EU member states with the Russian Federation which appeared to be in violation of EU law. The logical approach of the member states should have been to ask the EU to negotiate on their behalf a single

agreement with the Russian Federation. Failing to do so, it gave the Russian Federation the ability to divide and rule the EU member states to the detriment of the EU and the individual member states. The last decision of Mr. Putin to stop the project South Stream to the EU shows the political character of this pipeline and its lack of commercial relevance

The recent failure to give a mandate to the European Commission to negotiate with Azerbaijan the issue of security of supply as a result of the purchase of DEFSA by SOCAR may further illustrate the reluctance of EU member states to give the European Union an *ex ante* role in the negotiation of such agreements in these sensitive external energy areas.

Finding 25. The integration of the neighbourhood in the EU market is progressing slowly

The Energy Community Treaty, a concrete attempt to extend the "European regulatory space" of the internal market to non-EU neighboring countries, under which they commit to adopt the "*acquis communautaire*" of the internal market for oil, gas and electricity, proved to be a promising tool to bring good governance to the South Eastern European countries, Moldova, and Ukraine.

However, it is marked by weak governance based on intergovernmental and unanimity decision making processes, with insufficient capacity building and institutional setting. It is too soft and does not have the necessary powers and resources to impose the rule of law, implement and monitor the necessary regulation in the countries concerned. Reinforcement is needed to make it a meaningful instrument. The case of Ukraine is illustrative: it would have been in a much better position today should it have implemented the reforms agreed a few years ago in the EU/Russia/Ukraine Troïka.

Finding 26. The relationships between the EU and Russia are in need of repair

The relationship between the EU and Russia has worsened over the last couple of years, culminating in the current military conflict in Ukraine. The number of conflicts, disagreements and frustrations between the EU and Russia is growing, from the absence of progress in the negotiation of a new strategic partnership (PCA), politically motivated price differentials for Russian gas in

the EU, the nuclear power plant in Kaliningrad, the South Stream project, the transit of gas through Ukraine, together with the successive waves of EU sanctions against Russia, including its energy sector.

FIGURE 80 ► EU external energy dependency per member state with focus on Russia

COUNTRIES WHERE RUSSIA REPRESENTS MORE THAN 50% OF " GAS TOTAL NET SUPPLIES" IN 2012							OTHER DEPENDENCIES	
EU COUNTRY	% OF GAS IN ENERGY MIX	NET SUPPLY GAS TWh	DOM. PROD. GAS TWh	SINGLE IMPORT SOURCE	RUSSIAN PART OF NET SUPPLIES	2ND LARGEST IMPORT PARTNER	OIL IMPORTS 2011	OTHERS 2011
EE	8.2	6.8	0.0	Yes, Russia	100%	none	not specified	Gas Networks
FI	9.4	38.8	0.0	Yes, Russia	100%	none	88%	Coal, 49%
LV	30.4	15.2	0.0	Yes, Russia	100%	none	not specified	Gas Networks
LT	38.5	34.2	0.0	Yes, Russia	100%	none	98%	Electricity, 45%
BG	13.6	29.6	3.5	Yes, Russia	88.8%	none	95%	Refining cap. 100%
HU	37.1	107.4	23.4	Yes, Russia	80%	none	100%	Uranium (majority)
SK	26.6	55.3	0.9	no	83.5%	Other, 22%	100%	
AT	24	95.9	20.2	no	60%	Norway, 15%	16%	Gas commerce
SL	10.2	8.3	1.0	no	60%	Algeria, 23%	not specified	
PL	12.6	176.9	49.5	no	58%	Other, 15%	92%	Coal, 7%
CZ	15.6	86.3	1.7	no	57%	Norway, 11%	59%	
GR	14.2	47.1	0.0	no	55%	Algeria, 18%	25%	

COUNTRIES WHERE RUSSIA REPRESENTS LESS THAN 50% OF "GAS TOTAL NET SUPPLIES" IN 2012							OTHER DEPENDENCIES	
COUNTRY	% OF GAS IN ENERGY MIX	NET SUPPLY GAS TWh	DOM. PROD. GAS TWh	SINGLE IMPORT SOURCE	RUSSIAN PART OF NET SUPPLIES	2ND LARGEST IMPORT PARTNER	OIL IMPORTS 2011	OTHERS 2011
RO	30.6	144.7	109.5	Yes, Russia	24.3%	none	27%	Petrol Stations
DE	20.8	909.1	120.1	no	37.3%	Norway, 29%	39%	Coal, 4%
IT	36.9	792.6	91	no	28.8%	Algeria, 29%	16%	
LU	22.5	13.7	0.0	no	24%	Norway, 51.8%	not specified	
FR	14.3	492.4	5.8	no	16%	Norway, 42.6%	11%	
NL	42.2	426.2	742.7	no	5%	Norway, 50%	31%	
BE	25.5	178.8	0.0	no	< 1%	Norway, 36.8%	45%	

COUNTRIES NOT IMPORTING ANY RUSSIAN GAS IN 2012							OTHER DEPENDENCIES	
COUNTRY	% OF GAS IN ENERGY MIX	NET SUPPLY GAS TWh	DOM. PROD. GAS TWh	SINGLE IMPORT SOURCE	RUSSIAN PART OF NET SUPPLIES	2ND LARGEST IMPORT PARTNER	OIL IMPORTS 2011	OTHERS 2011
HR	30.1	31.2	21.1	no	0%	other, 37%	not specified	
CY	0	0	0	no	0%	none	not specified	~ 30% of total FDI
DK	19.6	37.5	67.2	no	0%	net exporter	net exporter	
IE	29.7	52.6	2.4	no	0%	other, 94%	0%	
MT	0	0	0	no	0%	none	not specified	
PT	18.7	50.1	49.5	no	0%	Algeria, 54%	< 10%	
ES	22.6	362.6	1.1	no	0%	Algeria, 44%	15%	
SE	2.3	12.9	0	yes	0%	other, 100%	51%	
UK	35.5	855	452.1	no	0%	Norway, 34%	9%	Coal, 24%

OVERALL EU 28 DEPENDENCY ON RUSSIAN GAS							OTHER DEPENDENCIES	
COUNTRY	% OF GAS IN ENERGY MIX	NET SUPPLY GAS TWh	DOM. PROD. GAS TWh	SINGLE IMPORT SOURCE	RUSSIAN PART OF NET SUPPLIES	OTHER IMPORT PARTNERS	OIL IMPORTS 2011	OTHERS 2011
EU28	23	5060.9	1712.1	no	24%	Norway: 22.6%, Algeria: 9% Qatar: 6%	33%	Coal, Uranium, Electricity, Refining capacity

Source: Aggregate data from Eurostat, Eurogas, Bruegel, online media, 2014

The European Commission has opened formal proceedings in 2012 to investigate whether Gazprom may be in breach of EU antitrust rules, and in particular whether it may be abusing its dominant position in several Central and Eastern European gas markets regarding tariff-based discrimination and oil-indexed prices. Should the investigation prove any breaches, Gazprom would have to cease these practices and it might be subject to considerable financial penalties. At the same time, Gazprom is probably one of the main beneficiaries of the new EU gas market rules in terms of trading activities and access to end customers. This is in contrast with the launch by Russia of a consultation procedure within WTO about the third energy package.

FIGURE 81 ► Price differentials for gas purchased from Gazprom

COUNTRY	GAZPROM BORDER PRICE (€/MWH)
Estonia	31.32
Latvia	28.86
Lithuania	35.20
Romania	26.30
Hungary	27.47
Slovakia	28.40
Czech Republic	27.81
Germany	25.83
Italy	28.74

Source: European Commission, 2014

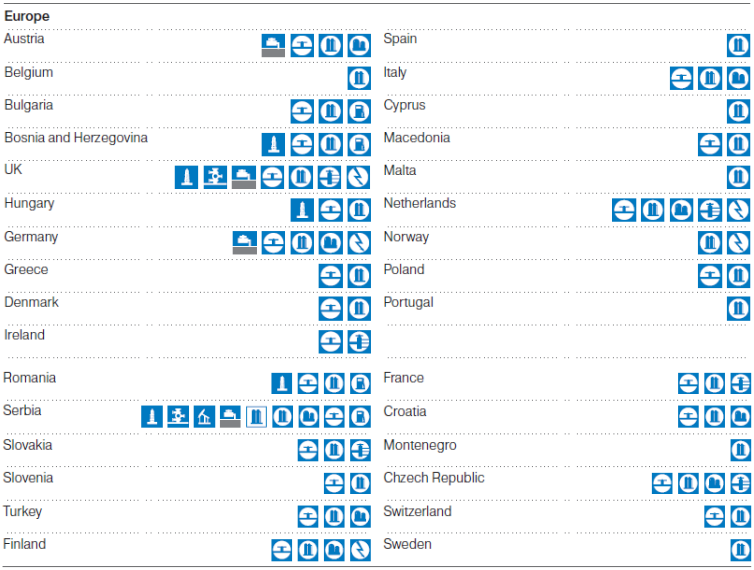
Meanwhile, Russian direct and indirect stakes in EU energy markets are increasing, both as oil, coal and uranium supplier, as well as investor in a wide range of key EU assets including refineries, storages, transmission and distribution systems of gas, sales and trading of raw materials. EU-Russia energy interdependence, which will remain for a while, is not managed in a collective and consistent way. Swap agreements favored by Russia with European companies are not creating a level playing field for EU companies in Russia.

FIGURE 82 ► Top 5 destinations for Russian oil, gas and coal, total EU imports from Russia and overall consumption

GAS (2012)	OIL (2012)	SOLID FUELS (2012)	URANIUM
Germany (32.3 bcm)	Germany (35 mt)	UK (12.3 mt)	Germany
Italy (21.8 bcm)	Poland (23.5mt)	Germany (10.1 mt)	France
Poland (9.8 bcm)	Netherlands (15mt)	Poland (9.3 mt)	Belgium
Hungary (8.1 bcm)	Belgium (11.6mt)	Finland (5.3 mt)	Netherlands
France (7.5 bcm)	Italy (9.2mt)	Netherlands (3.5 mt)	Spain
Imports from Russia: 106 bcm - 160bcm	Imports from Russia : 175 mt	Imports from Russia: 52.7 mt	
% of total imports: 23-39%	% of total imports: 31%	% of total imports: 23%	
Total cons. EU: 392.8 Mtoe	Total cons. EU: 586.6 Mtoe	Total cons. EU: 293.9 Mtoe	

Source: Aggregate data fromEurostat, Eurogas, 2014

FIGURE 83 – Gazprom's activities in Europe



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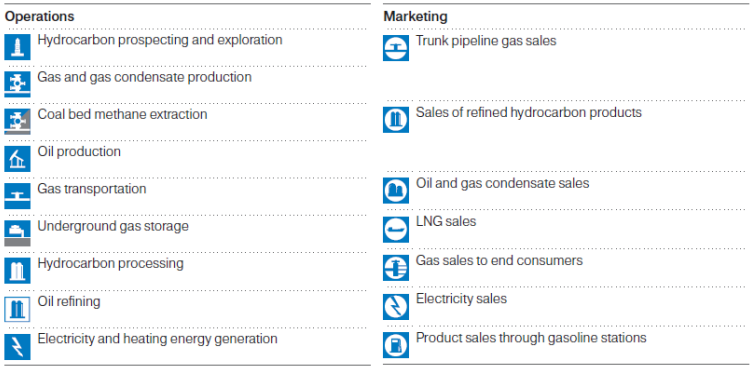

Source: Gazprom, Annual Report, 2013

As concerns the current crisis over gas delivery to and transit through Ukraine, the EU is taking its responsibility and is playing a key role in the current trilateral dialogue/negotiations with Ukraine and Russia. However, as long as the EU member states are not ready to align their position at EU level, Russia will continue to play off member states bilaterally to the detriment of the whole EU.

Finding 27. The integration of energy in the general EU external policy is necessary to have an impact

The progressive approach and discussion over energy issues at the EU Foreign Affairs Council, with the assistance of the High Representative for Foreign Affairs and the European External Action Service (EEAS) is a step in the right direction. However, while energy policy has an important strategic/external dimension, the latter remains the prerogative of the EU member states.

Despite the progress achieved on the external side, together with the too slow improvement of EU's external representation by the Lisbon Treaty, the EU is still too often absent on the international energy scene. The inability of the EU and its member states to deliver a strong and convincing single message (so called "Speaking with one voice") to its external partners and suppliers remains.

At multilateral level, such as in the International Energy Agency, the EU remains an observer alongside the EU member states, which are not sufficiently coordinating their positions. Furthermore, the lack of multilateral instruments in the field of energy is maintaining uncertainty on exploitation and transport of resources. In the EU context, the potential of GATT/WTO and other bodies has not been properly assessed. The re-launch of the Energy Charter Treaty is another question mark.

2.4. In conclusion – The need for action

Finding 28. Fragmentation of the system

Although much has been achieved in the last decade, it has not removed the fragmentation of the system. Sometimes, even positive developments have come with shortcomings which remain largely unaddressed. The internal market needs to be achieved and updated in order to cope with the new shortcomings and challenges that emerged in the last couple of years. The European energy policy does not provide for an efficient and coherent external dimension enabling the EU to responding to strategic energy issues.

National solutions have proven inadequate and have increased the risk of diverging and conflicting responses to common challenges. The adequate EU governance to deal with the lack of coordination and cooperation between EU member states and stakeholders is missing. Soft instruments and loose coordinating structures simply do not work. The coordination of opposite views without a clear common vision and willingness to act together cannot produce any result.

The EU cannot directly set the direction of research and development, investments, infrastructures, diversification or taxation policies that will allow it to achieve its competitiveness, sustainability and/or security of supply objectives.

Finding 29. The risk of muddling through

There is as such no guarantee that the present approach will be sufficient to bring about the economic, industrial, and societal changes necessary for the EU transition to a low-carbon economy by 2030-2050. In light of previous and recent developments, it remains to be seen how far EU member states and stakeholders are actually ready to move forward together in a qualitative leap past the notion of national energy independence and truly embrace their *de facto* interdependence in a common European energy policy.

Finding 30. An historic European convergence of national energy profiles and systems

The EU energy policy is now half way between national policies mainly driven by national considerations and a common energy policy based on integrated energy markets. This is the side of the coin that needs to be emphasised.

Indeed, the EU is equipped with a relatively well-developed set of rules in the field of energy. The third internal energy market package, together with other key EU regulations and directives in the field of electricity, gas, RES, efficiency, infrastructures have brought a real convergence of the 28 national energy systems, models and regulatory framework that is unique on the international scene and irreversible at European level.

3. The needed technical approach: ten immediate actions for the European energy policy and its stakeholders

The European energy policy requires the active involvement of the European institutions, the member states and all other key energy stakeholders to overcome the identified shortcomings and stumbling blocks. No EU member state has the means to face all challenges on its own. An "energy market failure" may well topple a government not only in weaker member states but even in strong ones. Furthermore, soft measures and loose cooperative structures are not sufficient to make hard choices and implement them. A genuine European energy policy and its expected benefits require that all EU member states and energy stakeholders adhere to it and participate in it.

If properly addressed, the European energy policy would be a powerful instrument that would bring a wide range of pragmatic and efficient answers to the identified shortcomings. There are three key objectives that a comprehensive European energy policy should achieve as a matter of priority. And there are ten meaningful actions, together with concrete remedies, policy instruments and institutional frameworks that should be implemented in the short term in the new EU institutional cycle.

Objective 1. To achieve the European internal energy market

The internal market of electricity and gas has reached a point of no return. There is a consensus on the need to complete it. The European internal energy market, based on the adequate regulatory framework and interconnected infrastructures, remains the key tool at EU's disposal to achieve all its essential energy objectives simultaneously: the energy transition to a low carbon economy, the optimisation of allocation and development of domestic resources, the efficient use of energy, the security of supply and solidarity within the EU, the right signals to stimulate investments in power generation, transmission,

and distribution assets, and the economies of scale to develop and deploy new technologies. It aims to guarantee a level playing field for all participants to the market and to give the consumers the right to choose between competing suppliers.

An integrated, competitive, liquid and resilient European internal energy market will also be the strength of its external policy. It will make the EU stronger in its bilateral and multilateral relations with external partners and in its bargaining ability with external suppliers and transit countries.

Objective 2. To reap the benefits of the external dimension of the European internal energy market

EU member states and operators cannot deal with third countries anymore without taking the internal market dimension and common values into consideration. An EU approach in certain key areas is now necessary to ensure not only that bilateral deals by individual member states and companies with suppliers and transit countries benefit the entire EU market, but also that no third country/company can threaten key EU energy assets and infrastructures or engage in targeted reductions of energy supplies.

Beyond the current case-by-case and *ad hoc* approaches, the European energy policy should aim to develop the concrete and useful external dimension which brings real added value to issues related to the European internal energy market and its security of supply, with a specific focus on a clear strategy of diversification of supply sources and transit routes. Over time, it should also aim to put the EU and its neighbours right on track towards a pan-European energy market based on the EU model. This would keep under control the EU's increasing exposure to import dependency, particularly for EU member states that depend on a single supplier.

Objective 3. To enhance the governance of the European energy policy

Whereas the on-going attempts to progress cannot be denied – with the adoption of the 2030 Energy and Climate Package, the increased flexibility offered to EU member states in the implementation of the new EU objectives and targets for 2030 – they should nonetheless be accompanied by sufficient governance

and discipline, with enforceable rules, so that member states refrain from taking any measure undermining the internal market functioning and solidarity.

The European energy policy should be based on a strong, coherent, stable and modern European energy regulatory space governed by common institutions capable of delivering effective solutions. Concretely, the EU needs to design the adequate tools to enhance interaction between actors and policy areas within a consistent EU governance framework. Furthermore, tools to foster cooperation between national actors at bilateral and regional levels need to be reinforced.

The governance of European energy policy needs to be flexible in accommodating changing energy sources, technologies, and markets conditions and be consistent in balancing the three key objectives. It should be efficient so that the right decisions are taken in the relevant policy areas and channelled through the adequate institutional framework. Finally, it should be consistent in the implementation of common rules and disciplines, and be collective in order to guarantee the common interest in an economically cost-effective manner.

3.1. To achieve the European internal energy market

Action 1. A credible and stable EU regulatory framework for the full integration of the European internal energy market

> *"The internal market has to be completed. If we are successful in this, we will add another €200 billion of added value to the European economy. We have to do it"*. A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> *"This priority will require the mobilisation of a wide range of legislative, policy and financial instruments, across many essential sectors of our economy (…) that will follow political agreement on the 2030 energy and climate framework. (…) Increasing competition should help drive down costs for citizens and businesses and boost growth. (…) You will have to*

identify and select infrastructure projects on which to focus, assess the need to add to the current legal framework and monitor very closely the implementation of existing legislation". Mission letter to Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

"*The European Council noted the fundamental importance of a fully functioning and connected internal energy market. Recalling the March 2014 conclusions on its completion, the European Council stressed that all efforts must be mobilised to achieve this objective as a matter of urgency. Preventing inadequate interconnections of member states with the European gas and electricity networks and ensuring synchronous operation of member states within the European Continental Networks as foreseen in the European Energy Security Strategy will also remain a priority after 2020.*" European Council Conclusions, 23/24 October 2014.

A credible and stable regulatory framework for the full integration of the European internal energy market is the essential prerequisite of the European energy policy. A credible and stable regulatory framework at EU and member states levels is also the essential condition for attracting the necessary investments in the transition of the energy system, especially because these investments should remain primarily a matter for the market and investors. The 2020 objectives and the recently adopted 2030 energy and climate framework are setting a clear direction to be followed at EU and member states levels in order to update and transform the production, transport, distribution, storage and consumption of energy as well as to maximise innovation in the field of energy efficiency, renewable energy sources, carbon capture and storage (CCS), and application of information technologies for smartening the whole system. But these important high-level decisions have to be translated into various rules that have to be predictable. This is valid for:

- **The full achievement of the internal gas and electricity markets.** There is one key task here: implementation, implementation and implementation. This is valid for the EU directives, regulations and network codes.

- **The retail market rules and the various mechanisms to favour decentralised generation and demand response.** The consumers (industries and households) are now part of the electricity and gas markets. As such, they should be further empowered, taking into account the potential of demand response management aimed at both reducing the current forms of consumption and optimising the system in case of possible disruption. This necessitates to roll out smart systems to make the whole energy system fully interactive and responsive, involving all players: customers, prosumers, power generators, DSO's and TSO's, regulators, and member states.

- **Ensuring the interconnectivity of electricity and gas systems at EU level.** There is no integration of electricity and gas markets without the physical infrastructure to ensure the free flow of electricity and gas throughout the EU. To achieve the required level of interconnection for a well-functioning market is a major priority. All the tools are available to mobilise the resources to build the necessary infrastructures. Additional efforts have to be made concerning the supply of energy islands where alternative supply may depend on the existence of new infrastructures. The target of 10% of interconnections within the EU should be further articulated at the regional level where these interconnections are mostly needed. The real obstacles at national level, mainly economic and political, should be better assessed and then made public.

- **Energy taxation** should be further harmonised in the EU and better aligned with the 2020 and 2030 Energy and Climate objectives and targets.

- **The EU-ETS has to be reformed** to make it a robust system able to manage in the short term the reduction of emissions and to stimulate investment in low carbon technologies. The EU must be ready to make hard choices and take difficult decisions, which will allow the EU-ETS to perform in the long-term and predict a sufficiently robust carbon system and higher carbon price on a structural basis, in the form of, at least, a carbon price floor, or, at best, carbon taxation.

- **The consistent channelling of EU funds available** to well identified priorities contributing to the achievement of the internal market and the objectives set by the European Council, avoiding half-hearted measures and short-term politically driven infrastructures. The Juncker Plan should contribute significantly to this, but identifying the right projects and analysing their costs and benefits as well as establishing the actual cross-border allocation of costs are essential to secure public acceptance and a fast implementation.

- **The possible additional rules adopted at national level** such as regulated prices, subsidies schemes, the capacity remuneration mechanisms and other strategic reserves, have to be fully compliant with EU rules and guidelines, while not undermining the internal market.

Action 2. A European framework for security of gas and electricity supply

> "*Coordinating specific actions to strengthen energy security on a European scale, starting with the need to counteract any possible energy shortages over the first three to twelve months*". Mission letter to Maroš Šefčovič, Vice-President for Energy Union, Brussels, 1 November 2014.

> "*Recalling its conclusions of June 2014, the European Council endorsed further actions to reduce the EU's energy dependence and increase its energy security for both electricity and gas.*" European Council Conclusions, 23/24 October 2014.

The integration of the electricity and gas markets also requires an integrated approach of the security of supply, addressing national, regional and European markets to ensure a high level of security of supply. The gas crisis of January 2009 gave birth to a European security of gas supply regulation that is not matched by a similar regulation in electricity. The interdependence of electricity and gas justifies that both areas are addressed together in a EU binding regulation. Within the European energy policy, it is now necessary to define all the parameters of the security of energy systems, giving priority to electricity. It should offer to member states a level of security at least equivalent to what they enjoy today, thereby limiting the reasons for undermining national interventions

in this field and opening the way to joint actions by all stakeholders at relevant EU, regional and national levels.

Such EU regulation should be based on:

- Clear responsibility of the various actors,
- High level of standards of supply,
- Common rules and methodologies for adequacy of centralised and decentralised generation,
- Regular assessments of risks,
- Mechanisms of intervention and effective emergency mechanisms,
- Improvement of current regulatory framework for security of gas supply within the EU, in order to use the most cost-effective gas generation, transmission, storage and LNG facilities, and to enforce bidirectional flows on all pipelines.

Action 3. Increased empowerment of key European stakeholders

> *"The Union only succeeds when everyone is pulling in the same direction: this is why we should work in the months to come to forge a common understanding between the institutions about what we want to achieve and how we will go about it. (...) Completing the internal energy market, by connecting infrastructures and engaging with regulators and stakeholders at national and European level in order to improve, reinforce and fully apply EU legislation in this area"*. Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

The European energy market will perform only if key European stakeholders are strengthened and fully empowered to act Europe wide. Furthermore, all these players will need to be strengthened at the same time, as the ability of one to play its full potential will rely on the ability of others to cope also with their new responsibilities:

- **ACER** should be empowered to act as a European regulator, potentially take decisions that directly bind operators in cross-border issues, and be equipped with sufficient resources in order to cope with all its tasks and responsibilities in network codes, infrastructures and market operation including REMIT;

- **ENTSO-E** should be empowered to coordinate in real time the electricity flows throughout the EU;
- **ENTSOG** should be empowered to fully integrate the storages and the LNG terminals into the transmission network at least to ensure maximum flexibility and reliability in case of disruption;
- **DSO's** should be organised in a recognised single European organisation to promote the necessary common rules to accelerate the smartening of the system and the empowerment of customers, in full respect of privacy.

Action 4. Enhanced cooperation between member states at regional level

"My firm conviction is that we must move forward as a Union. We do not necessarily all have to move at the same speed – the Treaties provide for that and we have seen that we can work with different arrangements. Those who want to move further, faster, should be able to do so." A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

"Respect for the principles of subsidiarity, proportionality and better regulation will be at the core of the work of the new Commission. We will concentrate our efforts on those areas where only joint action at European level can deliver the desired results. When we act, we will always look for the most efficient and least burdensome approach. Beyond these areas, we should leave action to the member states where they are more legitimate and better equipped to give effective policy responses at national, regional or local level." Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

"The integration of rising levels of intermittent renewable energy requires a more interconnected internal energy market and appropriate back up, which should be coordinated as necessary at regional level. (…) The European Council agreed that a reliable and transparent governance system without any unnecessary administrative burden will be developed to help ensure that the EU meets its energy policy goals, with the necessary flexibility for member states and fully respecting their freedom to determine their energy

mix. This governance system will: (…) 6.3. facilitate coordination of national energy policies and foster regional cooperation between member states." European Council Conclusions, 23/24 October 2014.

The evolution of the last years has been very fast as the players were working more and more together to develop all the tools required by the third package. However, EU member states are lagging behind in the implementation of EU rules while, at the same time, they are tempted to take new unilateral actions not in line with the efforts made at EU level. They should be further encouraged to cooperate fully at regional level in certain areas on a pragmatic and functional basis and in full compliance with the EU rules, thus going beyond the many current *ad hoc* and voluntary approaches that neither cover all relevant challenging policy areas nor forbid their development.

The topics for the cooperation should be:

- **Optimising member states diversified energy systems and portfolios.** The aim is to identify economies of scale and complementarities by pooling their domestic resources in the most cost effective way, whether fossil fuels or preferably renewable/low carbon energy sources, and by interconnecting their energy networks and markets at the level required. With the rapid increase of RES, there is a need to implement an intraday and balancing market at regional and then European levels to take full account of the variable generation.

- **Channelling key information *(ex ante)* on national energy policies** between neighbouring countries and with the European Commission in order to fully assess their potential consequences on the common system and to examine the possible less disruptive alternatives.

- **Correcting excessive existing structural imbalances** between national/regional energy systems (North-Continental, Southern and Eastern mainly) in order to achieve a pan-European energy market over time and remove the remaining energy islands.

- **Creating *de facto* solidarity between member states, based on common risk assessments, for mutual assistance** to prevent and mitigate

the consequences of disruption through effective regional mechanisms and emergency plans.

- **Enabling real cooperation between member states on an increasing number of areas**, including:
  – Regulatory approaches on cross-border infrastructure project;
  – Capacity remuneration mechanisms;
  – Common support schemes for RES and energy efficiency not limited to national companies or national projects;
  – Boosting market integration such as market coupling, joint trading platform, and common technical standards;
  – Promoting technological innovation through common R&D programmes;
  – Pooling European, regional and national funding for common energy projects.

Regional cooperation should be flexible enough to be explored in various degrees of intensity. With regard to the structure and format for regional governance, it could be useful to use different "circles" of membership and to allocate the corresponding rights and obligations for core member states, participants and observers. Hence, some member states, being members of different regional groups could serve as bridges between the different regional groupings. Regional integration could also favour the creation of regional TSOs (or at least their enhanced cooperation) to reinforce the system and to act in real time. It could also act as a strong body for cooperation of all stakeholders.

To be successful, there are four main features that regional cooperation should have:

- Well-identified and operational objectives and/or targets, which receive firm political support at the highest level of the EU member states with the direct involvement of key competent stakeholders;

- Strong leadership from the European Commission which has to play the role of facilitator in all regional cooperation structures;

- Alignment of all means in order to create a level playing field, i.e. a clear, stable and predictable regulatory framework (software) combined with concrete infrastructures/market developments (hardware) supported by substantial financial means;

- Binding rules that are respected by member states and properly implemented by the actors in a collective way.

3.2. To reap the benefits of the external dimension of European internal energy market

Action 5. Ensuring compliance of intergovernmental agreements with the EU internal energy market

> *"If the price for energy from the East becomes too expensive, either in commercial or in political terms, Europe should be able to switch very swiftly to other supply channels. We need to be able to reverse energy flows when necessary."* A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> *"In order to increase the EU's bargaining power in the energy negotiations, make full use of the Decision establishing an information exchange mechanism with regard to intergovernmental agreements between member states and third countries in the field of energy, in particular as regards standard provisions and the Commission's assistance in the negotiations; encourage that member states and involved companies provide relevant information to the Commission and seek its support throughout negotiations, including on the* ex ante *assessment of the intergovernmental agreements' compatibility with EU legislation and its energy security priorities."* European Council Conclusions, 23/24 October 2014.

The internal market means gas-to-gas competition and the freedom for companies to conclude supply agreements with external suppliers, which will bring the best value for the consumers. However, at intergovernmental level, EU and

member states should agree to act in a transparent and coherent way with third countries, in full compliance with EU law. For this purpose, the European Commission should be able to fully play its role of guardian of the treaties in controlling the intergovernmental agreements on behalf of the EU, especially when they potentially affect the functioning of the internal market such as infrastructures, access to resources, and generation facilities. The role of the European Commission in this process both *ex ante* and *ex post* should be much clearer than the existing case by case basis, depending largely on the willingness of the member states.

There is a need to clarify these sensitive issues of competence, very close to national sovereignty, over fuel mix as well as over a fair degree of independence regarding bilateral relations, including when they serve to prepare a commercial agreement. If it happened again in the future that EU member states violate EU rules in this respect, the European Commission should, without delay, bring the case to the European Court of Justice and ask for its Opinion on that issue. Along the lines of the past AETR doctrine and case law in the fields of aviation, transport, trade and so on, the Court would have to determine how the EU external competence should be exerted in this area to achieve the European internal energy market and whether the European Commission should play the role of facilitator in negotiating the relevant intergovernmental agreements together with the member states.

Action 6. Moving towards a pan-European energy market with the EU and its Southern and Eastern neighbours

> "*I want to keep our European energy market open to our neighbours*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> "*Further strengthen the Energy Community which aims to expand the EU's energy acquis to enlargement and neighbourhood countries, in the light of the EU's security of supply concerns.*" European Council Conclusions, 23/24 October 2014.

As part of a far-reaching project to create a pan-European energy market, the Eastern and Southern neighbourhood should be at the heart of the external dimension of European energy policy and internal market, whether it is in the framework of the Energy Community Treaty and/or the relations with key partners such as Norway, Switzerland, Russia, and Turkey. This strategy should be based on the following priorities.

The EU and its neighbours must gradually **open up their respective energy markets** on a reciprocal basis, and develop with partners concrete co-development projects in the energy sector and, particularly, infrastructures, RES deployment, and energy efficiency. It also implies cooperation between regulators, network operators, and other stakeholders on both sides.

Key EU initiatives with neighbouring countries should also include bilateral mechanisms to prevent and manage crises: EU participation in financing the modernisation of their energy systems, inclusion of energy provisions in bilateral trade agreements and technical assistance, and public-private partnerships.

The EU must **remain firm** with the national authorities of these countries so that they implement the needed reforms in their energy sectors, and mainly when it comes to opening up their markets to competition. The Energy Community Treaty, which is the right model for the relations in the EU neighbourhood, should be expanded and strengthened in terms of governance, with sufficient capacity building and institutional setting, and of the necessary powers and resources to impose the rule of law and implement the necessary regulation in the countries concerned. Its secretariat should be reinforced and its interaction with the European Commission strengthened. Its decision making process should also shift from unanimity to qualified majority voting.

Norway plays a very important role in the energy policy of the European Union. It is part of the EEA and has quickly implemented the third package rules for electricity. Given its specific situation as a gas country with no gas market, it did it only partly for gas. EU and Norway should conclude a specific agreement covering all energy issues of common interest, with a view not only to reinforce their respective security of supply and security of demand, but also to integrate each other in a common energy market. There is a major

mutual interest in agreeing to present the resources of Norway as part of the domestic production of the EU/EEA, because it would not only reduce the level of import dependency but also because it would be good for the image of gas, severely damaged by geopolitical considerations in the last decade.

Switzerland, which is located at the heart of the European Union and thus is fully part of the trans-European networks, is less integrated to the EU than Norway. However, in the field of electricity, there is a major interest to conclude a long-term agreement, which should be highly beneficial for both sides.

Russia will remain a key energy supplier to the EU in the foreseeable future, making it essential to reconcile the existing EU-Russia energy dialogue with the long-term goal to achieve a comprehensive and strategic agreement. This will only be possible if the EU remains firm and assertive in making its principles and rules respected by the Russian Federation and its operators. This also implies to take better into account the existing interdependence between the EU and Russia in the energy field, which goes much beyond the gas sector, expanding to oil, coal, uranium, nuclear and other energy assets and infrastructures. Furthermore, it is also wise to better articulate energy interests with wider political/security developments.

Turkey's future role as a key transit country for the supply of natural resources to the EU must be associated in a common regulatory framework. This implies to avoid that Turkey becomes another "Ukraine", and to articulate better the energy interests with the broader political developments related to the enlargement process. It is particularly relevant to address the role of Russia and Turkey together, as they are now moving towards a partnership on gas along the Southern Gas Corridor.

3.3. To enhance the governance of the European energy policy

Action 7. Stronger leadership and authority of the European Commission

> *"We cannot and should not do everything: I want the European Commission to be bigger and more ambitious on big things, and smaller and more modest on small things. I also want us to focus our energy and efforts on ensuring effective implementation and follow-up on the ground. (…) We must abide by the highest possible professional and ethical standards at all times. I want the European Commission to lead the way as a modern, efficient and transparent public administration, open to all input that helps us deliver work of a consistently high quality, in full independence and impartiality. Our conduct must be unimpeachable. (…) We will have the privilege of being supported by an excellent, highly motivated European civil service and a professionally well-run administration, but its resources are limited and have to be used to best effect. This is also why I will want resources to be allocated to our priorities and to make sure that every action we take delivers maximum performance and value added."* Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

The European Commission has a unique and central role to play in the governance of the European energy policy, with regard to both its role of guardian of the Treaty and its right of initiative. It is only through its reinforced leadership that it will inspire the strong political will from the other two key actors in that field, i.e. the European Council and the Council on the one hand, and the European Parliament on the other.

The European Commission should have the highest authority in ensuring by all legal means the full implementation by member states and stakeholders of the applicable regulations (and network codes) designed to guarantee a level playing field for all players throughout the EU.

The European Commission should use its leadership to strengthen the EU's own resources and financial means based on fiscal/taxation instruments on energy

activities and to channel all necessary EU funds in order to fully support the European energy policy objectives at the EU, regional, national and local levels.

The European Commission should exercise the needed leadership in making forward-looking proposals and in facilitating the coordination and cooperation at all levels.

Action 8. Improved transparency, monitoring, and consolidation for a better regulation

> *"We must abide by the highest possible professional and ethical standards at all times. I want the European Commission to lead the way as a modern, efficient and transparent public administration, open to all input that helps us deliver work of a consistently high quality, in full independence and impartiality. Our conduct must be unimpeachable. (...) Promoting a proactive and coordinated approach to the follow-up, implementation, and communication of our priority policies across the Union and internationally."* A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> *"The European Council agreed that a reliable and transparent governance system without any unnecessary administrative burden will be developed to help ensure that the EU meets its energy policy goals, with the necessary flexibility for member states and fully respecting their freedom to determine their energy mix. This governance system will : 6.1. build on the existing building blocks, such as national climate programmes, national plans for renewable energy and energy efficiency. Separate planning and reporting strands will be streamlined and brought together; 6.2. step up the role and rights of consumers, transparency and predictability for investors, inter alia by systematic monitoring of key indicators for an affordable, safe, competitive, secure and sustainable energy system."* European Council Conclusions, 23/24 October 2014.

Transparency. All relevant information about national, regional, and European policy and market developments should be communicated by member states and stakeholders at EU level, that is between member states as well

as between member states and the European Commission. All relevant information and obligations deriving from a wide range of EU policies, packages, targets, processes, regulations and directives, as well as the implementation of EU rules should also be consistently channelled at EU level and assessed by the European Commission.

Monitoring. The overlapping of all complex markets and policy developments deriving from both analytical and monitoring processes, including binding and indicative national action plans, should then be consistently consolidated by the European Commission in a unique process leading to a revamped Strategic Energy Review every 18 months. The assessment would be based on key indicators allowing the "360°" measurement of the progress and the shortcomings in the integration of the European energy policy. It would require strengthening the analytical capacity within the European Commission.

Consolidation. At the end of the process, both European and national energy policies would be evaluated within the same structure, scope, timeframe, and methodologies. It would also enable to better assess the rationale for current and/or new policy tools and regulatory measures on a regular basis. This would also imply that the European Commission is equipped with the proper capacity of economic modelling. The Strategic Energy Review should then be discussed in a peer review process driven by the European Commission with the active contribution of all stakeholders: other EU institutions (the EU Parliament, ACER, ENTSO-E/G, the European Economic and Social Committee, and the Committee of the Regions), the European Council and its member states, and all other relevant stakeholders from the private sector and the civil society at different levels of governance. Such review is today practiced every 5 years by the International Energy Agency, which is a useful, but insufficient, observer of the EU energy policy.

Action 9. Further integration of energy into wider EU policies

> *"A new way of working. I want the Commission as a whole to be more than the sum of its parts. I therefore want us to work together as a strong team, cooperating across portfolios to produce integrated, well-grounded and well-explained initiatives that lead to clear results. I want us to overcome silo mentalities by working jointly on those areas where we can really*

> *make a difference. (…) To facilitate this, I have decided to organise the new Commission differently from its predecessors. I will entrust a number of well-defined priority projects to the Vice-Presidents and ask them to steer and coordinate work across the Commission in the key areas of the Political Guidelines. This will allow for a better focus and a much stronger cooperation amongst members of the College, with several Commissioners working closely together as a team, led by the Vice-Presidents, in compositions that may change according to need and as new projects develop over time*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

Because energy is at the crossroad of the European internal market, EU energy objectives and strategies should be better integrated into the definition and implementation of other relevant EU economic, industrial, social, digital, agricultural, environmental, consumer protection, and transport policies and activities.

Because energy is at the crossroad of the European economy and competitiveness, it would be appropriate to better articulate energy issues in the existing European semester and other relevant EU monitoring mechanisms such as the Macroeconomic Imbalance Procedure (going beyond the only dimension of net trade balance of energy products as relevant auxiliary indicator in the current process) or the Annual Growth Survey.

Because energy is at the crossroad of the European foreign policy, the integration of energy in the general EU external policies should be more systematic, including common foreign and security, trade, development, enlargement, and neighbourhood policies. Further coordination and coherence should also be brought between the various EU and national external actors and strategies involved, including the European External Action Service.

Action 10. Lessons from past successes: learning from key elements at the roots of EU's strengths in the field of energy

> "*Political prioritisation as the basis for a better, more focused Union will only work if it is done in partnership between the Union institutions and*

the member states, in line with the Community method." A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

It emerges from the present analysis of EU energy policy achievements that five key elements are at the roots of its main strengths and are essential preconditions for its success:

1. The objectives and/or targets are clearly identified, operational and endorsed by all actors.
2. A strong leadership from the European Commission inspires a firm political support from the European Council/EU member states and the European Parliament as well as the effective involvement of key competent stakeholders.
3. Binding rules are in place, respected by all member states and properly implemented by the actors.
4. All available instruments are aligned in order to create a real level playing field, i.e. a clear, stable, and predictable regulatory framework (software) combined with concrete infrastructure developments (hardware) and supported by substantial financial means.
5. Customers, 100% passive in the past, are allowed to play a more active role in the system and to reap the benefits from it.

These key elements illustrate that there are a lot of things that can be done in a concrete and pragmatic way when collective vision, leadership, political will, and the right instruments are aligned. All the positive changes that occurred should be strengthened as the engine of the next steps to be taken. Ignoring them and going back to the old days is not an option.

In conclusion, some of the actions proposed are new. Others are a *post hoc* rationalisation of the existing system and current shortcomings. All these actions should bring the EU at a higher level of integration in the field of energy, creating the right conditions for a forward-looking and resilient Energy Union.

4. Boosting the European project: the Energy Union

From the European Energy Community to the Energy Union

The concept of Energy Union is based on the original vision for a European Energy Community initiated in 2010 by Jacques Delors and Jerzy Buzek, then expanded on in a policy proposal of the Jacques Delors Institute. It has been introduced at the highest political level by former Polish Prime Minister Donald Tusk, followed by French President François Hollande, and then put several times on the European Council agenda by its former President Herman Van Rompuy.

Later on, the new President of the European Commission Jean-Claude Juncker has made it one of its key priorities, and shaped the new European Commission accordingly, with strong mandates given to the Vice-President for the Energy Union Maroš Šefčovič and the Commissioner for Energy and Climate change Miguel Arias Cañete. It clearly reflects the willingness to put energy as one of the priority issues in the new European institutional cycle:

> *"As we enter the new legislative cycle following the European Parliament elections in May 2014, the time has come for a new approach. (…) I therefore want to reform and reorganise Europe's energy policy into a new European Energy Union. (…) We need, as it was so often said during the Ukrainian crisis, a resilient energy union with a forward-looking climate change policy. We have to reorganise Europe's energy policy into a new European Energy Union*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> "*The European Council recalls its goal to build an Energy Union aiming at affordable, secure and sustainable energy, as stated in its Strategic Agenda, and will keep the implementation of this goal under regular review.*" European Council Conclusions, 23/24 October 2014.

Five potential pillars for a "resilient Energy Union" are emerging from the current debate: (i) Security, solidarity and trust, (ii) The completion of a competitive internal market, (iii) The moderation of demand, (iv) The decarbonisation of the EU energy mix, and (v) Technologies. However, these pillars fall short of expectations. The majority of the measures discussed are incremental and mostly aimed at addressing current shortcomings. The combination of these five pillars also bears the risk of repackaging the current approach based on the established order, processes, instruments, and technologies instead of being genuinely looking forward at the future and the progress towards a resilient Energy Union.

The European energy policy and the Energy Union should not be mixed and based on the same processes, objectives, and achievements. The European energy policy should address in the short-term the current shortcomings of energy systems and markets in the EU. The Energy Union should bring about a qualitative step but no *tabula rasa*. It should go beyond the current European energy policy, which is based on an internal market, on competition policy, and on environmental/climate measures. No concrete foreign energy policy has been developed up to now. The European Union is a long-term project for long-term results around one of the biggest challenges that is already shaping our future, namely the transition towards a low carbon economy.

The Energy Union will act as a booster and catalyser for the energy transition engaged in Europe, together with many other sectors and policies such as manufacturing industries, climate, transport, research, digital economy, agriculture, and so on. It should break the relative short-termism and inertia of the current system that frustrate progress. It should end the lack of political leadership and collective inability to break the obstacles that undermine efforts to cope with the energy transition. The complexity of the challenges related to the energy transition requires a multidisciplinary and multidimensional approach that goes beyond the current scope and present limits of the European energy policy.

The required evolution of the European energy policy into the Energy Union is not a matter of competence. There is neither a need to change the current EU legal framework and treaties nor a need to create a new centralised institution that would govern the whole EU energy system. While the

Energy Union does not attempt to set up a European energy mix, relying on national energy mixes does not mean that they should not be articulated in a more coherent and dynamic way, fully compatible with a well-functioning internal market. The energy system itself, with its European, regional and local levels of governance, will inevitably affect the national sovereignty over the energy mix and the energy supply, without any need to amend the treaty.

The aim of the following sections is to identify what the new challenges are, and to provide meaningful recommendations on the steps to be taken.

4.1. Adapting the European energy transition to a challenging global context

The Energy Union is expected to improve the European common understanding of the increasingly complex and fast changing global context in which the expected resilient Energy Union will develop. Once the European Union and all its forces have become better aware of and prepared for the increasing competition on the international energy scene in all its dimensions, the Energy Union can act as a catalyst for a decisive breakthrough in the energy transition.

4.1.1. The global context and the decreasing role and status of the EU

> *"After spending several years concentrating on crisis management, Europe is finding it is often ill-prepared for the global challenges ahead, be it with regard to the digital age, the race for innovation and skills, the scarcity of natural resources, the safety of our food, the cost of energy, the impact of climate change, the ageing of our population or the pain and poverty at Europe's external borders."* A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The debate over the Energy Union is taking place in a new international and European context, that is quite different from the one in 2007 and can be framed around the following global mega trends:

The change in world demographics will accelerate, with increasing population in both the emerging and poorest countries across Asia and Africa. Improved health systems will further extend life expectancy worldwide and cause therefore a significant ageing of populations.

The shift in demographics will be accompanied by the rise of the middle class at global level with a growing appetite for consumption of all types of goods and services, and therefore resource-consuming growth. This shift will also coincide with a rising desire for stronger involvement in governance and democracy. At the same time, inequalities between and within societies might rise, with further social exclusion for those already excluded from the system.

Unemployment will hit young people harder than the existing working population.

Urbanisation will increase massively, bringing new challenges and stress on existing resources, mobility, and community life. The role and influence of NGOs, cities, and other non-state actors will increase.

The shares of developing countries in global GDP, FDI, exports and trade will further grow and account for more than those of the "developed world", which will lead to a new world order. Demands from a growing number of (emerging) countries for further involvement in international institutions will rise and put a strain on global governance and the related multilateral decision making processes.

Trade in value-added goods and services will be more than ever based on the delivery of manufactured goods worldwide. Non-tariffs barriers will remain the key obstacle to global trade.

The balance of geopolitical power will become increasingly complex and might even cause further armed and/or frozen conflicts both between and within countries, mainly for nationalistic and/or ethnic reasons.

Mobility and migration flows between countries and continents will accelerate in an increasingly interdependent and interconnected world.

Technology, internet, computer power, and smart phones will continue to spread all around the world but with different pace and quality of services and equipment, thereby increasing inequalities in the access to the most advanced technologies. Technological innovation will continue to revolutionise the way our societies live and organise themselves. Shared networks will intensify and accelerate the interaction and knowledge of people and companies across the world, but they will also increase risks, threats, and the vulnerability of the cyber systems at global level. Shared networks and digital instruments will also enable more intrusions in private life.

Climate change will be an ever growing and pressing issue. The ecologic footprint of the current carbon-intensive models of growth will further exacerbate the correlation between GDP per capita and greenhouse gas emissions and thereby accelerate the global warming of the climate system. As a consequence, extreme weather events will increase in frequency and intensity, but will be unevenly distributed around the globe, hitting the poorest hardest.

Increased demography, trade, and mobility will further stimulate human demand for already stretched land, food, water, and energy resources, four vital areas that are also increasingly interdependent, as illustrated in the "perfect storm" metaphor. A shortage of one can increase the risk of shortage of the others.

These essential global trends are inevitably impacting the EU and emphasise the main structural issues that the EU will have to confront in the near future. First of all, its declining demography combined with a much older population. Second, its slow economic growth. Third, its higher unemployment, in particular of young and highly educated people. Fourth, its growing social inequalities. Fifth, the majority of technological breakthroughs in the information society and other sectors have been developed outside the EU, with mainly the US and China leading the race in innovation.

It appears clearly from this general projection that the main factor that will shape the development of the Energy Union is that the EU's position, status, and role in the new global world that emerges from the crisis are declining. This reduced importance of the EU, which affects equally the energy sector

and brings specific energy challenges, should be the key driver of the Energy Union both within and outside the EU.

4.1.2. The new challenges emerging from the energy transition

> *"Reform means change. I want us all to show that we are open to change and ready to adapt to it"*. Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

Energy systems at both global and European levels are facing increasingly complex issues that can escalate much more rapidly than they can be solved. Access to energy raw materials will lead to a fierce competition. It might even lead to conflicts between, on the one hand, an increasing number of consumers in emerging countries whose consumption is furthermore increasing, and, on the other hand, "historic net consumers" in developed countries among which the EU. Against such background, the EU will be characterised by flat energy consumption, a decline of fossil fuel production, and a parallel increase of import dependency. The EU will be surrounded by a tight geopolitical context both East and South, with direct consequences over the supply and transit of natural resources to the EU.

At both global and EU levels, **energy supply** will be split between centralised carbon and/or water intensive systems and low carbon decentralised technologies. The consumption of fossil fuels will depend more on their (likely to increase) price and their environmental impact on living conditions and less on their (increasing) availability.

Prices for electricity are likely to increase during the energy transition. The volatility of oil prices has now been a permanent feature of the energy landscape for the last 15 years. As long as they remain low, this will have a positive impact on EU's competitiveness and transfer part of the huge financial rent of oil from producers to consumers. But how producers will react to this in the long run is uncertain. Consumers have to hedge this uncertainty with "no regret" solutions. Lower oil prices can also be a further opportunity to invest in the competitiveness of future energy systems.

Energy systems will be more decentralised, with new actors being empowered at local level, bringing new approaches, which could at the same time ease the increasing challenge of public acceptance. Shared networks, information society tools, and smart grids will further empower the consumers in the system.

Last but not least, the **energy sector will remain the number one emitter of greenhouse gas emissions.** In the EU, the 2020 and 2030 strategies launched will probably achieve the results they ambition, but they are not sufficient per se and offer no guarantee that EU's objective to reduce greenhouse gas emissions by 80-95% by 2050 will be achieved. And with less than 5% of global emissions in 2030, the EU might have further difficulties to remain a central player, and to convince the other large emitters which want to remain competitive without paying the price for emissions.

The European Union, by **further engaging in its energy transition**, can address its main structural issues and weaknesses in terms of lack of domestic fossil fuel resources, its increasingly negative trade balance and higher import dependency, its sluggish level of innovation, and altogether its slow economic growth. Its new approach should build on its main strengths and achievements:

- its high level education system accessible to all,
- its internal market, which remains the largest and most profitable market in the world, both in terms of numbers of consumers and level of purchasing power, as well as in terms of volumes and wealth creation,
- its well-developed networks of physical and digital infrastructures.

However, as we have seen in Part 3 of this report, the European internal energy market is not fully achieved and needs substantial upgrading of the European energy policy framework before all its benefits can be reaped at EU level.

4.2. An Energy Union for all

> *"An agenda for Jobs, Growth, Fairness and Democratic Change that concentrates on the areas where the European Union is able to make a real difference. (…) I want a European Union that is bigger and more ambitious on big things, and smaller and more modest on small things"*. A New

> Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.
>
> "*With the start of the new Commission, we have an exceptional opportunity, but also an obligation, to make a fresh start, to address the difficult geo-political situation, to strengthen economic recovery and to build a Europe that delivers jobs and growth for its citizens.*" Mission letter to Maroš Šefčovič, Vice-President for Energy Union, Brussels, 1 November 2014.

Concretely, the Energy Union has the potential to offer a tangible European project for the energy of energy transition towards a low carbon economy based on sustainable and inclusive economic development, delivering profits and social welfare for all. A resilient Energy Union will also engage Europeans in a new strategy aimed at defending shared interests and at promoting common values in world energy affairs. There will be no silver bullet bringing a unique response to this unique challenge and to the related objectives of competitiveness, sustainable development, security of supply, or energy efficiency.

Against this background, the future drivers of the Energy Union for transformative change around the energy transition should be (i) sustainable economic development, (ii) solidarity and inclusion, and (iii) global strategic action and resilience. Concretely, there are ten suggested building blocks as cornerstones of the future Energy Union.

4.2.1. Sustainable economic development: the Energy Union's transition

The new European project of sustainable economic development that the Energy Union should derive from the energy transition requires (i) to shift the current economic growth model from supply to demand, (ii) to leverage a European industrial energy strategy driven by innovation, and (iii) to invest in education on the challenges and behaviours around the energy transition.

Building block 1. A new economic growth model – A shift from the supply side to the demand side

The global and European ecological footprint exceeds the earth biological capacity by a record margin. The current carbon intensive model of economic growth and social living is unsustainable. This is mainly the result of a major market failure that does not internalise the damage to environment in the cost of goods and services. The egoism of the present rulers in developed countries is the main reason for the lack of action to prepare a sustainable future for the next generations.

Sustainable development is the only way to develop our societies and, for future generations, to survive in the longer run. Sustainable development is not anymore a vision of the dreamers and idealistic thinkers but the necessary concrete project to reconcile the political, economic, social, and environmental realities.

However, short-termism still generally drives economic and industrial processes and business models despite noticeable exceptions. In order to break this negative mindset, the European economic growth model applied to the energy system should be rebalanced by shifting from the supply side to the demand side, and by shifting from uncontrolled patterns of high consumption to responsible patterns of tackling waste of resources. This requires the following adjustments in the EU.

All resources are articulated in a single energy transition

> "*Our internal market is Europe's best asset in times of increasing globalisation. I therefore want the next Commission to build on the strength of our single market and to fully exploit its potential in all its dimensions.*" A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The Energy Union is a unique opportunity to better combine all energy resources within the single energy transition process. The energy transition cannot be limited to the scope of the internal market for electricity and gas but

it should be extended to all energy resources, including oil, coal, nuclear and renewables. Electricity as such should not be given the same level of attention and urgency than the primary resources. This approach would end the artificial and historical fragmentation of policy and regulatory frameworks and markets for each respective energy resource.

This requires to better address the interaction between primary energy sources and electricity production and to better foresee the impact on future energy production. For instance, what will be, in ten to twenty years' time, the impact of over 40% of electricity produced from non-subsidised renewable energy sources with very low operational costs on energy prices and systems within the EU? What will be the future role of gas and its interaction, or not, with RES? What will be the new drivers for new investments in the energy system when all the conventional assets will have been depreciated? What will be the impact of lower oil prices on EU's competitiveness, security of supply, and sustainable development in the long run: will it be an argument for slowing down the energy transition or will it be an argument for using the new rent for further investing in new low carbon technologies, which would bring further competitiveness to the EU in the longer run? Now is the time to answer these questions.

Energy efficiency is a fuel

> "*We will contribute significantly to enhancing energy efficiency beyond the 2020 objective notably when it comes to buildings. A binding 30% objective for energy efficiency by 2030 is to me the minimum if we want to be credible and forward-looking. We cannot pretend to be the leader as far as climate change policy is concerned if we do not become more credible when it comes to energy efficiency.*" A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The Energy Union is also a unique opportunity to shift the historical EU energy policy approaches from the supply side to the demand side, from patterns of growing consumption to patterns of demand reduction, and from passive

consumers to empowered prosumers. This policy shift would reflect the new realities in our societies and a true democratisation of the energy system.

For this to happen, energy efficiency should be considered as an energy resource (i.e. the value of the resource saved) in order to compete on an equal footing with other resources in terms of political, economic, and financial support. The consumers (industries and households) should become active players of the electricity system and market functioning. They should be properly empowered in order to maximise the potential of demand response management aimed at both reducing the current forms of consumption and optimising the system in case of possible disruption. This requires to implement smart systems to make the whole energy system fully interactive and responsive while involving all players: customers, *prosumers*, generators, DSO's and TSO's, regulators, and member states.

A common carbon taxation offers a predictable and stable carbon price

> "*Contributing to managing the reduction of greenhouse gas emissions from the industrial and transport sectors in particular, as part of our overall effort to reinforce the sustainability of our growth model*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.
>
> "*Strengthening and promoting the Emissions Trading System to ensure we reach our climate goals in a cost-effective way*". Mission letter to Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

The development of this new economic growth model will only be possible if it takes place in a coherent and stable regulatory framework for a low carbon economy. This model includes production, transport, distribution, consumption, and efficiency as well as the maximisation of innovation in the field of energy efficiency, RES, transport, storage, CCS, and the application of information technologies for smartening the whole system. It must be understood that these investments should remain primarily a matter for the market and investors.

Concretely, it means that a real and credible price should be allocated to carbon emission. Especially at a time when it is almost impossible to predict future prices for any source of energy. This is a critical prerequisite to attract the investments necessary to update and transform the energy system.

Moving beyond the expected short-term revision of the EU-ETS, the EU should consider the adoption of a system of carbon taxation, as allowed by the WTO. Carbon taxation is the only way to get stable and predictable prices of carbon in a volatile economic, political, and technological environment, and taking into account our objective of a low carbon economy. A context of lower oil prices would ease the economic impact of such taxation, thereby allowing for a smoother and progressive start. This would enable a decisive push for the energy transition and sustainable economic growth model. Carbon taxation will address simultaneously the stability of the framework in spite of oil price volatility and the predictability of the regulatory framework as opposed to pure market mechanisms such as the EU-ETS, which are now manipulated.

Carbon taxation is exactly what a growing number of member states already do at national level. We were almost there in the EU in recent years, but it was repeatedly blocked by a minority of member states for reasons of national sovereignty over taxation. The EU-ETS, as the second best or minimalist option available, has been the only answer found so far at EU level to circumvent the veto of some member states on carbon taxation.

It would have made more sense to start with a system of carbon taxation, which would give a strong incentive to decarbonisation and would offer a predictable and stable price to carbon, allowing market forces to move in that direction. Once carbon taxation has become part of the real economy and business models, it could then be turned into a pure market based system such as the EU-ETS, which could be then progressively expanded at international level, in function of the progress made at multilateral negotiations.

Building block 2. An industrial energy strategy driven by innovation

> *"We need to strengthen the share of renewable energies on our continent. This is not only a matter of a responsible climate change policy. It is, at the same time, an industrial policy imperative if we still want to have*

> *affordable energy at our disposal in the medium term. I strongly believe in the potential of green growth. I therefore want Europe's Energy Union to become the world number one in renewable energies. I would also like to significantly enhance energy efficiency beyond the 2020 objective.*" A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The European Union, its member states, and its stakeholders struggle to adapt to today's hyper connected world system. The current system does not ensure that companies and financial systems give greater priority to long-term investments than to short-term profits. Technological innovation is often biased by the way institutions, governance, and markets are organised today to fight a carbon intensive energy system. This fact may well lead to a further promotion of the incumbent technologies and ultimately lead to a technological lock-in. The risk of a technological lock-in is further exacerbated by the lack of stability of the regulatory frameworks combined with insufficient policy and economic incentives.

The demand for new technologies and new patterns of consumption in the field of energy will not necessarily come from the general public and individual consumers. It is up to the (visionary and innovative) private sector and political (leadership) authorities to create this demand by further developing the adequate market instruments and regulatory framework, as well as to support the emergence of these technologies. It is only if consumers are first equipped with the adequate technologies and incentives that mentalities in societies will change, with, for instance, consumers being more motivated by tackling waste of resources than by uncontrolled high consumption patterns.

In order to remove current obstacles to further innovation and new entrants, the Energy Union should develop an industrial energy strategy driven by innovation. Priority areas and focus of investments should be low carbon technologies and digital energy. Setting up a multi-stakeholder governance of innovation is required. This is the only way for the EU to become finally the world leader in low carbon technologies and digital energy.

The projects related to innovation that should receive most investments and be developed in the two priority areas suggested are those which would bring the most added value in terms of competitiveness regarding economic profit and job creation, of sustainable development regarding carbon emission and energy intensity, and of security of supply. Such an approach would require developing complex and objective indicators to measure their added value on all these three essential dimensions.

Priority to low carbon technologies: innovation beyond deployment

Low carbon technologies should be a clear priority area for innovation in the EU. Beyond the current approach based on targets for the deployment of Renewable Energy Sources (RES), the long-term policy focus and targets should rather be on innovation to achieve EU objectives. Given that, today, the large majority of public and private funds available at both EU and national levels have been invested so far in the needed and justified deployment of existing low carbon technologies (RES mainly), the bulk of funds and subsidies should be channelled in the future towards the innovation of not yet mature or not yet available technologies.

It implies focusing on innovation on new technologies that are not yet available rather than on improvement on existing technologies where the learning curve is already quite advanced and where international competitors are also much more advanced.

In this respect, making electricity storage the first priority would channel the available means to it, with a major impact on the realisation of the energy transition which must include the mobility patterns. Making transmission and distribution grids smarter, more cost-efficient, and connected to all forms of storage, existing and new, would also ensure their better public acceptance.

Moreover, low carbon technologies go beyond the scope of the two key sectors of energy efficiency and RES. Nuclear energy requires that a major breakthrough is done by the nuclear sector in the fields of nuclear safety and waste management. With regard to current carbon intensive fossil fuel resources, it is up to the responsible sectors to invest massively in Carbon Capture and Storage (CCS) technologies. A key advantage of these technologies is their

great potential in terms of export outside the EU, while both nuclear energy and carbon intensive power production will last at global level for the coming decades. Innovation in low carbon technologies also implies to guarantee the access to the necessary raw materials and rare earth metals located in markets far outside the EU.

Equal priority to digital energy: smart energy consumers

> "*We cannot spend money we do not have. We have to replace deficits and debts by ideas. The ideas are there: we must make better use of the opportunities of the digital technology which knows no borders. We must break down national silos (…). We must knock down these barriers, these hurdles to growth. (…) We can create a fair level playing field where all companies offering their goods or services in the European Union are subject to the same data protection and consumer rules, regardless of where their server is based. By creating a connected digital single market, we can generate up to €250 billion of additional growth in Europe in the course of the mandate of the next Commission, thereby creating hundreds of thousands of new jobs, notably for younger job-seekers, and a vibrant knowledge-based society. (…) We will do it. (…) To achieve this, I intend to take, within the first six months of my mandate, ambitious legislative steps towards a connected digital single market (…). This should go hand-in-hand with efforts to boost digital skills and learning across society and to facilitate the creation of innovative start-ups. Enhancing the use of digital technologies and online services should become a horizontal policy, covering all sectors of the economy and of the public sector*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

Information society and digital energy should be given the same priority. Most of the needed digital tools and technologies that could modernise the energy system (by bringing further the interaction and flexibility between production, transportation, distribution, and consumption sides) as well as improve energy efficiency at all levels are already developed but are hardly available to the energy sector. In industrial terms, the focus and priority should be put on the innovation process, where most of the added value would come, rather

than on the manufacturing process, where the EU is in a difficult position to compete with emerging powers. Ensuring the introduction of digital energy in all energy processes is a priority.

The growing role of digital energy requires also to innovate in protecting the system against cyber-attacks relying on the necessary cyber-security capacity. The Energy Union should offer a better understanding of common threats between member states and governments, the private sector and companies, the civil society and individual users. It should then ensure a level playing field for the development of new economic opportunities and marketing of new services in that area.

An energy valley in Europe

> "*We need smarter investment, more focus, less regulation and more flexibility when it comes to the use of these public funds. (…) To make real projects happen, we also have to develop more effective financial instruments, including in the form of loans or guarantees with greater risk capacity. (…) For this, the investment environment has to be improved and fund absorption needs to be strengthened.*" A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The main obstacles reside in the energy sector itself, as it is not ready to integrate low carbon and digital energy technologies in the current system. In addition, the interaction is poor between the energy sector, the manufacturers of the necessary equipment, the innovators, and the consumers, as is illustrated in the buildings sector for instance. The Energy Union should also improve the multi stakeholder governance of innovation and resolve at the same time the current fragmentation at national level of both public and private R&D programmes and funding invested in the field of energy. EU initiatives and programmes to support innovation as well as the emergence of European champions will be necessary.

> "*The jobs, growth and investment package announced should help to mobilise additional public and private investment in infrastructure such*

> *as energy networks, as well as in renewable energy and energy efficiency*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

> "*This should allow us to mobilise up to €300 billion in additional public and private investment in the real economy over the next three years. (…) The focus of this additional investment should be in infrastructure, notably broadband and energy networks as well as transport infrastructure in industrial centres; education, research and innovation; and renewable energy. (…) The mid-term review of the Multiannual Financial Framework, scheduled for the end of 2016, should be used to orient the EU budget further towards jobs, growth and competitiveness*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The Juncker Package of €315 billion would probably better be invested in innovation rather than in the deployment of classical physical infrastructures, as an intelligent energy system is likely to reduce the need for physical infrastructures. This is particularly true for the electricity system which is undergoing a silent revolution.

The future role of subsidies

> "C*urrent geopolitical events have forcefully reminded us that Europe relies too heavily on fuel and gas imports*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

Another obstacle to innovation in low carbon technologies lies in the still very significant **subsidies to fossil fuels within the EU**. They should therefore be phased out within the EU, and redirected to low carbon and digital energy innovation. Phasing them out beyond the EU should also be a goal of the EU energy diplomacy.

With regard to renewable energy sources, their subsidies should be progressively phased out regarding their deployment in the market. In parallel, these subsidies should be redirected to further innovation in low carbon technologies. Another idea would be to give back to the citizens what has been made possible thanks to the public subsidies and taxes to help RES penetration in the energy mix. Once the RES are fully profitable, a part of the economic benefits derived from their contribution to electricity generation with very low operational costs could be reinvested in innovation in other new low carbon technologies.

Last but not least, energy taxation remains a key area of credibility of the objectives set by the European Council to decarbonise the energy sector. The inability of the member states to align the energy taxation along the objectives set by the European Council is a major failure to be remedied by the Energy Union.

Building block 3. Invest in education on the challenges and behaviours around the energy transition

> *"A significant amount should be channelled towards projects that can help get the younger generation back to work in decent jobs, further complementing the efforts already started with the Youth Guarantee Scheme, the implementation of which must be accelerated and progressively broadened"*. A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

A sustainable economic growth model should be built with the full involvement of the young generation. In addition, it should be based on the appropriate education of citizens on the challenges and behaviours related to energy transition. As energy transition is also a matter of responsibility for all individual consumers, EU-wide specific programmes of information, awareness-raising, and education should be developed in order to ensure understanding, public acceptance, and active support of regional and local initiatives accelerating the energy transition.

Moreover, there is a need to upgrade higher education on energy transition for the present and future generations to help them innovate and develop new

business models. A new EU-wide programme similar to Erasmus in the field of sustainable economic development and energy transition should be developed as soon as possible to highlight the critical importance of this matter. It should be seen as a multidisciplinary task involving all relevant disciplines underpinning the energy transition sought.

4.2.2. Solidarity: an inclusive Energy Union

The current political approach of energy transition lacks an intergenerational vision and the awareness of growing inequalities in societies. New methods and actors have not yet been factored in by political and institutional leaders and stakeholders. And the current level of cooperation between EU member states does not reflect the reality of the energy system and its fast evolution, nor the needed new methods and processes characterised by unity in diversity within the European Union.

Building block 4. A social energy policy

> *"The European Union has come through one of the most testing periods in its history. The effects of the economic and financial crisis are still causing great hardship in many parts of Europe. We live in a Union with a 29th state of unemployed people, many of them young people who feel sidelined. (…) In the future, any support and reform programme goes not only through a fiscal sustainability assessment; but through a social impact assessment as well. The social effects of structural reforms need to be discussed in public. I am a strong believer in the social market economy. It is not compatible with the social market economy that during a crisis, ship-owners and speculators become even richer, while pensioners can no longer support themselves. (…) Until this situation has changed, this 29th state must be our number one concern, and we have to be very determined and very responsible in carrying out our work"*. A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

Energy poverty goes beyond energy prices: it is also about empowerment

Modernisation can inflate inequalities and lead to further exclusion of people. Energy poverty is already a growing phenomenon not only outside but inside the EU. As energy prices are likely to increase and may not be sociably acceptable, the Energy Union should provide for clear definition, strategy, and support for weaker consumers, taking into account the needed subsidiarity and national, regional, and local action.

Energy poverty, however, goes much beyond prices. The Energy Union should fight energy poverty at its roots through social protection measures and investment programmes for the empowerment of all consumers in line with the technological breakthrough to come. Households that do not have affordable access to energy and/or cannot be empowered for structural economic and social reasons should not remain outside the system. They should therefore benefit from the support of social policies at EU, national, and local levels.

This requires to better anticipate and assess the impact of future low carbon and digital technologies on society at both public and private levels. This also applies to the organisation of society at the level of states and regions, at the level of urban and rural areas, and at the level of households and individuals. In general, the economic profits derived from the energy transition should also be translated into fairly distributed social welfare. This also means that part of existing funding and subsidies in the energy sector should be redirected to the less favoured consumers.

Employment: potential for SMEs and social energy dialogues addressing the transition

> *"It is mainly companies that create jobs, not governments or EU institutions. (…) New, sustainable and job-creating projects that will help restore Europe's competitiveness need to be identified and promoted. (…) Jobs, growth and investment will only return to Europe if we create the right regulatory environment and promote a climate of entrepreneurship and job. (…) SMEs are the backbone of our economy, creating more than 85% of new jobs in Europe"*. A New Start for Europe: My Agenda for Jobs,

Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

With regard to job creation, policies and the majority of investments should be focused on SMEs. Similarly, priority should be given to the innovation in services in both energy efficiency and the development, deployment and maintenance of low carbon technologies. Best practices in this field should be further examined in this respect, such as the Danish voluntary approach toward a low carbon society.

A social energy policy should also address the energy transition in terms of employment, in terms of the jobs to be created and of those that will progressively disappear. Given the scope of the industries potentially affected all across the EU, a specific process of social energy dialogues might be initiated at EU level. Such a social dialogue should be based on managing all the consequences, positive and negative, of the energy transition. It should be part of the democratisation process affecting the energy sector.

Building block 5. Innovative governance leading to the State of the Energy Union

"*We now need to work together. In spite of our differences, there is a large convergence of views on the main priorities to be tackled at European level. And I want to work with all of you to build a broad consensus, across the EU institutions, on what we need to deliver for Europeans. And then follow words with action by delivering on what we have agreed*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

"*I want you all to be politically active in the member states and in dialogues with citizens, by presenting and communicating our common agenda, listening to ideas and engaging with stakeholders. (…) Assessing how and whether proposed new initiatives fit with the focus of the Political Guidelines. (…) on the basis of sound arguments and a clear narrative that is coherent with the priority projects of the Political Guidelines*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel

> Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

Democratic legitimacy and public acceptance require to further include all stakeholders and civil society actors in the governance of the energy transition. The Energy Union has to ensure a fair balance between EU, regional, national, and local decision-making processes, as well as between urban and rural solutions.

It requires a multi-stakeholder approach through innovative coalitions based on compelling experience and best practices. It would enable the further interaction and exchange of best practices between all energy stakeholders instead of the current naming and shaming approach, as so often illustrated in conferences. Bringing together the EU, regional, national, and local levels of governance in an operational interface with all actors would also strengthen and smarten the whole energy system across Europe.

The new governance should also include a regular review of policy achievements, of political mandates, of economic strategies, and of social impact. The energy transition necessitates already anticipating its future development, from now on until 2050. The process of debate and consultation initiated with the EU Roadmap 2050, but stopped by EU member states, should be relaunched in the coming months.

This can only happen if the current governance structure is optimised in a new innovative, open, and transparent platform for participation and consultation of all stakeholders in the EU energy decision-making processes.

A virtual energy community of all players

In concrete terms, and in line with the spirit of public consultation already practiced, this could be done by setting up a virtual platform managed by the European Commission. This would be to debate the regular assessment and new initiatives presented by the European Commission consolidated in an annual State of the Energy Union which is political and addressed to all. It would be driven by the European Commission with the active contribution of other EU institutions (the EU Parliament, the European Economic and Social

Committee, the Committee of the Regions, the European Council, and the member states), ACER, ENTSO's, and all other relevant stakeholders from the private sector, businesses, NGOs and other actors from the civil society at different levels of governance. The signatories of the Covenant of Mayors and other cities participating in European programmes should also be involved.

Participation to this virtual platform should be properly organised, to ensure representativeness and to allow for debate. It would also be a powerful incentive for stakeholders to strengthen their representation and positions at EU level. Such a virtual forum does not rule out holding an exceptional meeting in the form of a State of the Energy Union Convention.

The existence of such an interface does not imply that all existing forums and bodies should be abolished. However, they should be made temporary and with clear objectives to be achieved with concrete instruments and processes, and be discontinued once their objectives are met. This would have the merit of simplifying the whole system of governance for participation and consultation in the field of energy and of ending the existing pixelated system of fragmented forums, *ad hoc* groups, and bodies that are currently working in silos.

Building block 6. Unity in diversity – European optimisation of resources and infrastructures

> *"My emphasis will be on concrete results (…). Beyond that, I will leave other policy areas to the member states where they are more legitimate and better equipped to give effective policy responses at national, regional or local level, in line with the principles of subsidiarity and proportionality. (…) Effective policy-making also requires a deep understanding of every one of the member states, of their common challenges and of their diversity"*. Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

> *"Political prioritisation as the basis for a better, more focused Union will only work if it is done in partnership between the Union institutions and the member states, in line with the Community method. (…) My firm conviction is that we must move forward as a Union"*. A New Start for Europe: My

> Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The European energy reality is made of diversity: energy mixes, sources of fuels, domestic production, centralised and decentralised generation, levels of interconnections, storages, LNG terminals, and so on. These assets should be seen in a common perspective, as the internal market rules invite to do. The strengths of the system should be reinforced in order to mitigate its weaknesses. In other words, pooling the good resources to optimise the whole energy system, in normal times as well as in emergency, would bring benefits to all. It only requires the will to work on such a task.

The optimisation of member states energy systems can only be achieved through a strong cooperation between all concerned parties. The parties should have in mind to identify and improve their complementarities by pooling, in the most cost effective way, their domestic resources (be they fossil fuels or preferably renewable/low carbon energy sources), and by interconnecting their energy networks at the level required.

Cross-border cooperation should be encouraged at all levels with a view to come to concrete and operational solutions – e.g. to pool complementary resources, to share some infrastructures, to design common emergency plans, and so on. A number of examples, like BEMIP, exist already but they are still too isolated to deliver all the possible results and to avoid the waste of resources *(See Action 4 in Part 3 of this report as a starter).*

For this cooperation, the Community method should be relied upon. Coordination is not sufficient. It is a common view and common solutions that have to be pursued and invented to address common problems.

4.2.3. Europe in the world: a resilient and strategic Energy Union

> *"We need a stronger Europe when it comes to foreign policy. The Ukraine crisis and the worrying situation in the Middle East show how important it is that Europe is united externally. There is still a long way to go. (…) We cannot be satisfied with how our common foreign policy is working at the*

> *moment. We need to be more effective in bringing together the tools of Europe's external action. Trade policy, development aid, our participation in international financial institutions and our neighbourhood policy must be combined and activated according to one and the same logic*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

All the objectives and projects suggested for the Energy Union, from a sustainable economic growth model to solidarity, have an external dimension and should also be coordinated by the Energy Union on the international scene through:
(i) a trade policy for the defence and promotion of the EU's sustainable economic interests inside and outside the EU,
(ii) a development policy for the defence and promotion of European values of inclusion and energy transition vision abroad,
(iii) a European energy diplomacy for the defence and promotion of EU strategies in bilateral and multilateral forums, and
(iv) a European Energy Information Agency for the EU's common analysis, outlook, and strategic thinking in the field of energy.

Building block 7. An energy trade policy for the defence and promotion of the EU's sustainable economic interests outside the EU

> "*We need to pool resources, and combine infrastructures vis-à-vis third countries. We need to diversify our energy sources and reduce the high energy dependency of several of our member states. (…) Europe's energy dependency should also be reduced by diversifying sources and routes of energy imports and pooling our negotiating power*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

> "*Increasing Europe's energy security by diversifying sources and routes of energy imports and combining our negotiating power*". Mission letter to Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

As the largest economic and trading bloc, the EU has a lot to offer to external partners and to bargain with energy suppliers. Strategies to share and spread risk, and to make the best use in world affairs of the combined weight of the EU, its member states, energy markets, and operators can be more effective than dispersed unilateral actions. In the present world, there is a need and an obligation to think in terms of interdependency rather than of dependency.

Aggregation and not individualisation of risks

The best way to enhance the diversification of fossil fuels and raw material sources and transit routes for the common European interest and its security of supply is to aggregate the risks, considering both the demand inside the EU and the supply outside the EU. The Energy Union should allow to aggregate the risks related to both supply, transit, and demand of fossil fuels (oil, gas, and coal) and raw materials (uranium, rare earth metals, and so on) instead of the current approach based on individual risks for EU member states. It would necessitate to:

Aggregate risks over supply: more suppliers

This is particularly true for gas, a commodity which, in contrast with oil and coal, does not have a global market, has several regional prices, depends more on pipelines than on flexible transport means, and is too often used as a political leverage. The more suppliers there will be, the more resilient the supply to the EU will be. It would mitigate EU's increasing exposure to import dependency, and particularly for EU member states that depend on a single supplier.

A European strategy to aggregate risks over gas supply should be to diversify geographically the gas sources (e.g. the Caspian Sea Basin, the East Mediterranean, Northern Africa) and new LNG sources (e.g. East Africa and the US), and to strengthen the historical strategic partnership with Norway and other key suppliers and transit countries. When united and acting strategically, the Energy Union could establish the framework conditions with these countries, allowing EU companies to enjoy a stable and predictable regulatory framework conducive to mutually beneficial security of supply and security of demand.

Aggregate risks over demand: pooling the purchase of external gas supply and the financing of major transnational infrastructures

It must be understood that the best guarantee for the security of gas supply is a well-functioning internal gas market, offering all companies the possibility to compete for the best conditions of gas supply, including in crisis time, hence the importance to review the contents of the gas supply standards and their implementation. However, there may be market failure justifying the pooling of gas purchase. Solutions have also to be found to the current absence of EU commitment in the form of collective leveraging of demand or formal financial guarantee that other major consumer countries, like China, can offer to suppliers.

Subject to the principle of freedom of companies to source gas according to their commercial interest, the Energy Union should also explore in concrete terms the possibility of pooling the purchase of external gas supply or of securing the **financing of major transnational infrastructures** for gas transportation (Pipelines and LNG terminals) by establishing *"Ad hoc Gas Purchasing Group(s)"* in exceptional and duly justified circumstances and subject to full respect of competition and internal market rules. It would aim at giving participating companies, operators, and/or consumers a genuine power to negotiate with external suppliers. In all cases, it would require the EU's involvement both *ex ante* (providing authorisation) and *ex post* (ensuring compliance with EU law).

Such an approach would be relevant in the following circumstances:

- When an external supplier requires a single European buyer and this new source of supply would benefit the European consumers in terms of diversification (routes, sources, and counterparts);
- For a group of small companies and operators and/or weak and fragmented public and/or private consumers which are not involved in the production and/or transport of the gas from new sources of supply. This is already taking place within the EU for both gas and electricity with a growing number of regions and/or municipalities organising themselves to purchase gas and/or electricity;
- As part of a European emergency mechanism to obtain urgent deliveries by external suppliers to EU companies.

- Through auctioning mechanism open to all interested companies.

One key instrument: EU trade agreements for energy, including investment

For the sake of diversification of supply and transit, **the Energy Union should develop trade agreements including energy** with the current and future main energy partner countries abroad, in order to, not only, develop common approaches to security of supply, but also promote trade relations and economic opportunities among industry players on both sides.

Such intergovernmental agreements concluded between EU and a third country should be powerful tools to develop balanced relations between all member states and such third country, for the benefit of all EU and third country companies in a spirit of reciprocity. It would also put an end to asset swaps between a third country and European companies leveraging for their own profit the access to EU market.

The access to the EU internal market by third country companies should be subject to an equivalent access to their market through EU negotiated agreements for transparent, stable, and reliable legal frameworks for investments with partner countries. The trade strategy to be developed under the Energy Union should therefore also cover the issue of **foreign investments in critical energy assets and infrastructures**, as all its external partners do for the access to their domestic markets to be promoted and negotiated in bilateral agreements. This should create a level playing field for all EU companies in third countries, and enable non-EU companies to benefit from the internal market advantages while respecting its rules. This could pave the way for a further opening up of the EU energy markets to interested foreign companies, but only if it is in full compliance with EU law and if it also enables EU companies to invest in the energy sector of the countries concerned (upstream and downstream), according to the rules and parameters negotiated in the framework agreements.

The authorisation and certification of access to the EU internal market for third country companies should also be addressed at EU level, well beyond the existing third country clause in the third internal market package. It is desirable to establish a EU watchdog for foreign investments in key energy

assets (similar to the control existing in some member states and in third countries such as the US, Russia, or China) and composed of representatives from the European Commission, the Council, and the European Parliament's TRADE and ITRE committees.

Building block 8. European public-private partnerships for low carbon energy cooperation and development

> *"The EU has a proud record of international co-operation and of providing development support and assistance to many parts of the world. Your objective will be to ensure that we can adapt our development policy to the evolving needs of our partner countries, delivering on our commitments to the Millennium Development Goals (MDGs) and the eradication of poverty in the context of sustainable development"*. Mission letter to Neven Mimica, Commissioner for International Cooperation and Development, Brussels, 1 November 2014.

In order to achieve the United Nations Millennium Development Goals in the field of energy, an ambitious and strong European public-private partnership for low carbon energy development should be set up with developing countries interested in moving towards a low carbon energy system.

EU programmes should be smart, innovative, and multidimensional in order to cover simultaneously the issues of investments in their energy sector, of transfer of low carbon technologies, of exchange of best practices especially in terms of governance and regulatory framework, and of building domestic know-how and expertise. It should consistently deal with the challenges posed by the interdependent issues of stressed demand of energy, food, land, and water, in the inherent nexus symbolically called the "perfect storm".

In concrete terms, a programme of "Electricity for All" should be offered by EU organisations and companies to all countries where 25% of the population has no access. It should be based on both the EU's own resources and the pooling of existing funds and instruments at public and private national levels. The European Development Fund and other similar tools should therefore be used.

Building block 9. A European Energy Diplomacy – A single message with multiple voices

> "*We need to unite our negotiating power vis-à-vis third countries*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

Bilateral diplomacy: energy partnerships and dialogues

The energy transition requires a multifaceted international approach, combining economic, industrial, technological, and (geo-)political aspects. Beyond the issues related to the supply of fossil fuels and raw materials, renewed dialogues and partnerships are an opportunity for the EU to promote its foreign direct investments, to open new markets for its technologies and services, and to share its vision of the energy transition pathway and innovative governance across society.

Existing energy partnerships and dialogues driven today by the European Commission with third countries or organisations are not delivering the best results because the member states do not support them actively, especially when they have their own dialogues. Large member states especially are used to bilateral energy partnerships and agreements covering their main interests. This is undermining the credibility of both the Union and the member states concerned. It will be more beneficial if energy partnerships and dialogues are concluded by the European Union, in full cooperation with member states, particularly those willing to participate actively.

As part of a far-reaching project to create a pan-European area of security and prosperity, the Eastern and Southern neighbourhood should be at the heart of the external dimension of the Energy Union, whether it is in the framework of the European Neighbourhood Policy, the Eastern Partnership, the Union for the Mediterranean and/or the Energy Community Treaty. This stragegy cannot be limited to transfering the EU energy *acquis* to neighbouring countries but should be based on the priorities mentioned in Action 6 of this report.

Multilateral diplomacy: the long-term road towards global energy governance

Reflecting the existing conflict between producers and consumers of fossil fuels, there is no energy governance at world level. All existing organisations (IEA, IEF, IRENA, ECT, but also GATT/WTO and UN) have a limited impact on the world energy governance. As energy is also a permanent source of economic and political instability, there is a clear need to work at a multilateral governance of energy. This will not happen overnight, but the EU could be more active toward such goal, as it has been with the creation of IRENA under the impetus of Germany.

At multilateral level, the key priority for the EU should be to promote and contribute to the development of the adequate frameworks of governance of energy at regional and multilateral levels, which are largely missing between consumer, producer, and transit countries simultaneously. It will be a very long and difficult process, but the EU is best placed to push for it and the challenge is worth trying.

The EU should also maintain and develop its efforts to build a strong and effective multilateral framework for addressing climate change at a global level, in preparation for the decisive COP21 conference in Paris in December 2015.

Crises, conflicts, and alliances: the role of EU-NATO cooperation on energy

Against the background of an increased interdependency, the external energy issues can also bring with them conflicts and crises, as repeatedly shown with Ukraine and Russia. This crisis/conflict prevention dimension will thus have to be addressed as part of the European energy diplomacy.

Energy security in the narrow sense of security has a military dimension or at least an intelligence dimension for which the EU has no specific competence. It should co-operate with NATO in these delicate areas that affect directly the energy sector: physical protection of critical infrastructures, protection of routes, intelligence, cyber-security, and so on. This cooperation should be formally acted.

A European Energy Diplomacy - A single message with multiple voices

> "*With regard to the Union's external action, (...) the new High Representative will play her role as a Commission Vice-President to the full. She will notably steer and coordinate the work of all Commissioners with regard to external relations through a Commissioners' Group on External Action to develop a joint approach. The High Representative/Vice-President will regularly report back to me and the whole College about geopolitical developments. (...) Whenever she sees the necessity to do so, she will ask the Commissioner for European Neighbourhood Policy and Enlargement Negotiations and other Commissioners to deputise in areas related to Commission competence*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

> "*Use EU and member states foreign policy instruments to convey consistent messages related to energy security, in particular to strategic partners and major energy suppliers.*" European Council Conclusions, 23/24 October 2014.

All these bilateral and multilateral tasks and objectives require that the EU develops its energy diplomacy. A European energy diplomacy should convey a clear message to the external world and third countries (US, China, India, Russia, Iran…) and strengthen the EU's role in international organisations such as the WTO, UN, IEA, IRENA, IEF, ECT, NATO, and so on.

A European energy diplomacy requires that a clear message is conveyed to all our partners in the world, be it by national authorities and diplomats or by European authorities and diplomats. The long-used leitmotiv "speaking with one voice" should become "a single message with multiple voices". The repetition of the same message will ensure unequivocal understanding by the external partners. An incremental European energy diplomacy will enable the EU to promote better its multiple interests in the field of energy for its economy, its industry and its foreign policy.

In this context, the Energy Union should improve and manage the growing involvement in energy issues of "Foreign Affairs" actors such as the National

Ministries of Foreign Affairs and other diplomatic actors as well as the High Representative of the Union for Foreign Affairs and Security Policy and the European External Action Service. The EU Foreign Affairs Council can also address energy issues better in its activities and deliberations, and provide the necessary political will for EU collective action in that field. The same applies to the European Parliament's Committees responsible for foreign affairs, trade, development, and other external areas.

The European External Action Service, under the authority and leadership of the High Representative of the Union for Foreign Affairs and Security Policy, has a specific role to play as collector of information in third countries and as the monitor of this information on both thematic and geographic issues. The new High Representative should act at her level as EU spokeswoman to deliver some of the key EU messages abroad, and bring further coherence between the Energy Union and the general EU external policies including common foreign and security, trade, development, enlargement, and neighbourhood policies. The European energy diplomacy should also strengthen the link between the various actors involved (producers, consumers, and transit countries) and improve the interaction between the various aspects at stake (geopolitics, economics, industry, trade, technology, and cooperation and development).

Building block 10. A European Energy and Climate Information Agency: a common platform for common analysis, understanding, and forward-thinking

> "*Promoting a proactive and coordinated approach to the follow-up, implementation, and communication of our priority policies across the Union and internationally*". Mission letters to Maroš Šefčovič, Vice-President for Energy Union, and Miguel Arias Cañete, Commissioner for Climate Action and Energy, Brussels, 1 November 2014.

> "*We need better mechanisms in place to anticipate events early and to swiftly identify common responses*". A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission, by Jean-Claude Juncker, Strasbourg, 15 July 2014.

The importance of transparency through shared information, collective monitoring, and common assessment is reiterated. A solid policy cannot be built without the necessary economic and technical intelligence to underpin it. The example of the Energy Information Administration (EIA) in the United States demonstrates this. It requires that the Energy Union is equipped with its own capacity to compile up-to-date and accurate energy statistics, without relying anymore on the data and outlooks provided by international, individual member states or private stakeholders.

This should be an executive **European Energy Information Agency** within the European Commission in full cooperation with Eurostat with regard to the treatment of statistical data communicated by EU member states. This Agency should be able to look at all synergies between energy and climate with other sectors and its remit should apply to both EU internal and international developments.

Its task should be to produce an annual *European Energy Outlook*. It would enable to better articulate the overall European vision of energy transition and increase the visibility and impact of EU energy policy both within and outside the EU, in ways the IEA, the EIA and other leading private companies already do.

The energy transition would also require that the Energy Union is able to operate over long-term horizons. This would imply that the European Energy Information Agency is given the proper capacity of economic modelling, something which, today, is delegated to external organisations at significant costs for and without any control and ownership of the EU. Long-term horizons also imply that this Agency includes a forward studies unit that would act at the crossroads between other international players in the field and the community of experts (academics and think tanks) who are consistently providing expertise, ideas, and thinking out of the box. At the end, it will greatly help the Energy Union to shape its vision for the energy transition and the paths to achieve it.

CONCLUSION – A DECISIVE BREAKTHROUGH

In 1951, some European states decided to pool their interests in two key sectors of the economy in order to create a Community that would replace conflict by cooperation and animosity by prosperity. Energy was one of these sectors.

Whereas energy has come at the top of EU's political and economic agenda, the rules and governance that once served to ensure equal access to common resources need to be reframed in a manner commensurate with the challenges Europe faces. The difficulty of this task is compounded by the economic, political, social, and environmental crises our societies are facing, which call for new priorities while at the same time reduce the available options. Will Europe choose to play a pro-active role in the new industrial revolution, or will it be content to follow the lead set by others? Those who will master new technologies will take a strategic advance in global competition and governance.

Despite the spectacular increase since 2007 in regulatory activity aimed at creating a new Energy Policy for Europe, EU member states still favour national solutions to global energy challenges. As in 1951, there must be concerted actions among all stakeholders to help collective ambitions on energy become a reality. Ensuring economic prosperity, security and stability of energy systems, and the transition towards a low carbon economy require collective energy-related solutions. And these collective solutions should build on regional, national, and local strengths in order to optimise synergies and complementarities of energy resources, networks, and players.

Concretely, the Energy Union is capable to offer a forward-looking European project for all, under two conditions. It must be tangible: speeches and declarations with no follow-through will not suffice to answer citizens' concerns and call for a common political project in the field of energy. It must be inclusive and interactive: the Energy Union should enable sustainable and inclusive economic development creating profits and social welfare for all. A resilient

Energy Union will also engage Europeans in a new strategy aimed at defending shared interests and promoting common values in world energy affairs.

There will be no silver bullet bringing a unique response to this unique challenge and the related EU objectives of competitiveness, sustainable development, security of supply, or energy efficiency. Against this background, the future drivers of the Energy Union for transformative change around the energy transition should be (i) sustainable economic development, (ii) solidarity and inclusion, and (iii) global strategic action and resilience. Concretely, there are ten building blocks as cornerstones of the future Energy Union.

These three main areas and ten building blocks for priority actions for the Energy Union over the next 5 years EU institutional cycle will lead to decisive changes, paving the way to greater integration, competition, cooperation, and solidarity in the energy field, both within and outside the EU.

The long-term project to be carried out by the Energy Union will only be possible if the European energy policy is revised and finalised in the short-term. Revising the European energy policy is a unique opportunity to build a stronger and more coherent European energy regulatory space governed by common institutions able to deliver effective solutions on the basis of democratic legitimacy. It will take time to carry out the full reform needed and the EU cannot afford to wait too long to build a coherent and effective common energy policy.

The next European institutional cycle will have to enable the adoption and implementation of the binding instruments reflecting the new realities and needs of the energy policy of the EU and its member states, paving the way for an increasingly necessary European energy policy and, at the same time, by devising what should be the common vision and collective approach towards the meaning, scope, and instruments to be developed under the value-added concept of an Energy Union.

The Energy Union and the European energy policy have a common goal: to promote the integration of energy markets for the benefit of citizens in Europe and beyond. Freedom from energy insecurity reduces the risks of conflict. Peace is what Europe is about. Humanity is at a crossroads. It is critical to start now the Energy Union for the long-term.

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FROM THE EUROPEAN ENERGY COMMUNITY TO THE ENERGY UNION

A POLICY PROPOSAL FOR THE SHORT AND THE LONG TERM

In 2010, the Jacques Delors Institute launched an in-depth study of the future of European energy policy based on Jacques Delors' policy proposal for a "European Energy Community". It opened up a wide debate with local, national and European public, private, and civil society stakeholders from the energy sector and beyond. Four years later, the adoption of the 2030 Energy and Climate Framework by the European Council and the start of a new EU political and institutional cycle in 2014 give the chance to assess the state of play of the European energy policy and to identify the necessary new paths to ensure the desired European integration and reap all its benefits. At the same time, the new concept of Energy Union, which has been advocated by the new EU leaders, without giving it a concrete content yet, opens a wider debate on the future challenges to be addressed in the field of energy.

Against this background, the present report examines the evolution of the European energy policy from 2007 to 2014, including the most recent developments and the adoption of a new 2030 EU Energy and Climate Framework. The strengths and weaknesses of the European energy policy are identified and assessed in thirty findings. Relying on the conclusion that the existing European energy policy requires additional measures, the report suggests the three key objectives to be achieved in priority by a comprehensive European energy policy. It expresses ten meaningful recommendations for action, together with concrete remedies, policy instruments and institutional frameworks that should be implemented in the short-term within the new EU institutional cycle. Last but not least, it attempts to bring forward-looking ideas and key areas for action to achieve an ambitious and inspirational Energy Union, and to make it a fundamental element of the solidarity between the member states within the European Union and beyond in Europe.

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