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TAKING STOCK OF GERMAN ENERGY POLICY IN A EUROPEAN CONTEXT

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SUMMARY

In face of the Ukrainian crisis, the security of supply of natural gas has moved to the center of the debate on European energy policy. This sometimes blinds to the fact that there are further challenges in European energy policy need to be addressed.

For Germany, due to its energy transition, **there are three problems that can only be solved on the European level:**

1. In spite of the energy transition, CO_2 emissions in Germany are rising.

This is a result of a surplus of emission certificates within the Emissions Trading System (ETS), which is mainly caused by the falling production after the economic crisis in 2009. Thus the CO_2 price has declined, and electricity generation from black and brown coal has been rising, while climate-friendly gas power plants throughout Germany have generated less and less electricity or have even been completely decommissioned. **CO_2 emissions in Germany will only be lowered by a European approach, through a modification of the ETS.**

2. In spite of the rise in electricity generation from coal, electricity costs in Germany are high.

This is partly due to the EEG apportionment which has been raised to 6.24 cents per kilowatt hour in 2014. While the industry and private households in Germany are facing higher costs in order to reduce emissions, the CO_2 emissions reduced in Germany are caused elsewhere in Europe, because CO_2 certificates are cheap. The Intergovernmental Panel on Climate Change (IPCC) says that ideally, emissions should only be limited by the trading of emissions rights. Additional promotion schemes for renewable energies on the national level would only increase costs, but have no effect on climate change mitigation.

This proposal is not without reason, but is unlikely to be implemented. Another more cost-efficient way could be the **European harmonization of promotion schemes**.

3. Germany is in risk of shortages of electricity supply during peak times, when the sun and wind cannot generate enough energy.

At the same time the operation of natural gas power plants, which could fill these gaps, is currently not economically feasible for energy suppliers. Shortages of supply could be prevented by electricity imports from the European neighbour countries, which would require the creation of a **transnational transmission grid**. German utility providers prefer the creation of a **Europe-wide supply capacity market** in which the state pays power plant operators for the provision of electricity generation capacities even if they are not used.

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INTRODUCTION

In 2010 Jacques Delors and Jerzy Buzek called for the creation of a European Energy Community[1]. Since the beginning of the Ukraine crisis, this idea has been taken on the agenda again. But where does European energy policy stand in the year 2014? The following discussion and analysis shows an overview of the current state of European energy policy and comprises of the following sections (**1.) Energy generation and climate protection**, **(2.) EU domestic energy market** and **(3.) EU foreign energy policy**. These dimensions correspond to the target triad of climate protection, energy affordability and security of supply. The electricity and heating sector are considered in this discussion leaving out the transport sector. Special consideration is given to the German debate on the field of energy policy.

1. Energy generation and climate protection

In the Lisbon Treaty, for the first time energy policy is given a separate chapter receiving its own primary legal basis. **Article 194 (1) (c) TFEU** defines the "promotion of energy efficiency and energy saving and the development of new and renewable forms of energy" as an objective of the Union's energy policy to be pursued **"in a spirit of solidarity between the member states"**.

In accordance with the jurisdiction of the European Court of Justice[2] one can argue whether Article 194 TFEU imposes an **obligation to create a common energy policy** on the EU when interpreted in pursuance of Article 3 TEU[3]. It is also argued that the standards of the industrial and environmental policy, which are subject to similar regulation approaches as energy policy in the EC Treaty (Art. 157(1) EC Treaty and Art. 174 (1) EC Treaty), do not constitute non-binding policy guidelines but rather legal obligations according to general perception. According to that, the EU is not only entitled but also obliged to take action when such need is established[4].

1.1. Subsidiarity principle in the choice of energy sources, member states' veto right

"**Measures significantly affecting a member state's choice between different energy sources** and the general structure of its energy supply" shall be adopted by the **Council acting unanimously** after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions in accordance with Article 192 (2)(c) TFEU.

- This entitles the member states to a **right of veto** concerning their choice of energy sources.
- Moreover, Article 194 (3) TFEU stipulates that **measures primarily of fiscal nature** are subject to a special legislative procedure to be **unanimously** implemented in the Council.

1. Jacques Delors, Jerzy Buzek, "Full text of the Buzek and Delors Declaration on the creation of a European Energy Community", 5 May 2010, http://www.europarl.europa.eu/former_ep_presidents/president-buzek/en/press/press_release/2010/2010-May/press_release-2010-May-4.html;jsessionid=6078DF4E9A68846A59107C2C4357527A [26.08.2014].
2. ECJ Judgement of 22 May 1985, Case 13/82: The ECJ derived the obligation to introduce a common transport policy from Article 3 of the EEC Treaty.
3. Client Earth, "The impact of the Lisbon Treaty on climate and energy policy - an environmental perspective", 01/2010, http://www.clientearth.org/reports/clientearth-briefing-lisbon-treaty-impact-on-climate-and-energy-policy.pdf [07/07/2014].
4. Ulrich Ehricke, Daniel Hackländer, "Europäische Energiepolitik auf der Grundlage der neuen Bestimmungen des Vertrags von Lissabon", in: ZEuS Issue 4/2008, p. 579-600, here: p. 586.

1.2. Objective: 20% renewable energies in the total energy consumption of the EU by 2020

The **"Renewable Energy Directive"** (Directive 2009/28/EC) stipulates that the share of energy from renewable sources in its gross final consumption, i.e. also energy consumed in the fields of **electricity, heating/cooling and transport**, shall amount to at least **20%** in all of the EU **by 2020**.

The shares imposed on the member states vary. They are based on the rates achieved before the adoption of the directives. These shares are binding, i.e. in the case of **failure to attain these goals, the EU may impose penalties** on the respective member states, for instance in the form of fines or initiating infringement proceedings[5].

1.3. Promotion schemes for renewable energies in electricity generation

There are two promotion schemes for electricity generation within the EU.

- First, there is the German **feed-in scheme** of the Renewable Energies Act (EEG) that has been taken over by a majority of members states.
  - **EEG compensation scheme**: Producers of electricity from renewable sources sell their electricity to regional network operators and receive a price above the market price, the so-called **minimum purchase price and EEG**. Network operators sell the electricity to the end consumer and are returned the difference between the market price and the price paid to the plant operator. This reimbursement is financed by the EEG apportionment paid by all consumers.
  - **Market premium scheme**: Since 1 January 2012 plant operators may also directly sell their electricity on the electricity exchange. Operators receive the regular market price below the fixed rates according to the EEG on the electricity exchange. The difference between the fixed feed-in compensation and the market price achieved (determined by monthly average exchange price for electricity) on the electricity exchange is compensated by the market premium.
  - **Tendering scheme**: The financial support and its respective amount for renewable energies shall be determined in a competitive process via technology-specific tenders by 2017. The quantities of renewable energy capacities to be set up annually shall be determined by means of a tendering scheme and auctioned. In this scheme only market participants awarded the respective contracts in the tendering process may build renewable energy plants from 2017 onwards. The electricity fed in will be funded with the price per kilowatt hour set in the auction.

- Second, there is the **quota scheme** applied in Sweden and was also formerly applied in the United Kingdom.
  Producers are imposed a certain quota for electricity from renewable energies that can also be met by buying certificates for "green" energy in this scheme.

1.4. Competition concerns in comparison with the German Renewable Energies Act

On 18 December 2013, the EU Commission initiated **aid proceedings against** the EEG in the version valid as of 1 December 2012. The EU Commission is reviewing the **compensation mechanism** of the EEG and the reduction of the EEG apportionment for electricity-intensive companies ("**special equalisation scheme**") and for "green electricity suppliers" ("**green electricity privilege**"). With regard to the compensation mechanism

5. Dorien Bennink et al., "The Accountability of European Renewable Energy and Climate Policy", April 2011, http://www.climnet.org/resources/doc_view/1878-ce-delft-the-accountability-of-european-renewable-energy-and-climate-policy-apr-2011 [07/07/2014].

the EU Commission already made aware that they may accept it[6]. With the EEG reform of 27 June 2014 the "**green electricity privilege**" was **cancelled**; and in addition, the Federal Republic of Germany is obliged to pay a fine of 50 million EUR appropriated to an EU infrastructure project. With regard to the "**special equalisation scheme**" the EU Commission and the Federal Republic of Germany have meanwhile agreed to retrospectively review reductions for the years 2013 and 2014 on the basis of the stricter rules of the new EEG. As a result, around 350 companies have to expect additional payments totalling 30 million EUR for the two years, which is less than one percent of the current reductions amounting to 5.1 billion EUR.

With regard to the EEG exemptions for electricity-intensive companies the EU Commission particularly demands that companies generating their own electricity are not exempted from the EEG apportionment. **The EEG reform of 27 June 2014** took this into account and a **gradual access to an EEG apportionment for self-generated electricity consumption will follow**. All new renewable energy and highly efficient combined heat and power plants shall pay a 30% apportionment for the electricity consumed until the end of 2015, this figure being 35% in the following year and finally 40% for all new plants from 2017 onwards. All remaining plants will pay the total EEG apportionment. **The EU Commission will still not accept the exemption of existing plants from the payment of the EEG apportionment**. For this reason the current EEG reform shall be evaluated and a proposal for a future regulation shall be submitted by 2017.

Moreover, the EU Competition Commissioner Joaquín Almunia demands that **imported green electricity should also be supported by the German green electricity scheme**. On 1 July 2014 the European Court of Justice (file number: C-573/312) ruled that a respective regulation in Sweden restricted the free movement of goods within the EU, however, this restriction was justified by the interest of the general public to promote the use of renewable energy sources in order to protect the environment and tackle climate change. The Federal Government agreed to provide access to German green electricity promotion to foreign producers from 2017 according to the latest EEG reform, which is, however, limited to 20 megawatts of new electricity output. This corresponds to a good three percent of the development of renewable energies determined by the Federal Government totalling 6000 megawatts per year and shall correspond to the size of current green electricity imports in terms of percentage. **Foreign suppliers will only receive access to a small part of photovoltaic promotion** within the scope of a pilot project to test the tendering process until 2017. It is still controversial whether electricity imported to Germany may be charged the EEG apportionment.

1.5. Lack of compatibility of promotion schemes for renewable energies with the EU Emissions Trading System (ETS): additional costs

The **member states** avail themselves of **different national promotion programmes** for the development of renewable energies, whose benefit for climate protection is considered controversial due to the simultaneous existence of the European Emissions Trading System. This problem could be overcome by means of **harmonising the promotion programmes** for renewable energies on a European level.

The Intergovernmental Panel on Climate Change (IPCC) points out in its report "**Climate Change 2014: Mitigation of Climate Change**"[7] that emissions trading systems on a higher legal level do not work with other CO_2 reduction systems on a national legal level.

The "carbon tax" in Great Britain is explicitly stated, however, also the German feed-in scheme as part of the Renewable Energies Act (EEG) may be understood as addressee of the raised criticism. As CO_2 emissions are capped by the **Emissions Trading System**, systems such as **CO_2 taxes and feed-in compensation** for electricity from renewable energies do not lead to CO_2 reductions on a national level.

6. Federal Ministry for Economic Affairs and Energy, "EU-Hauptprüfverfahren zum EEG", http://www.bmwi.de/DE/Themen/Energie/Energiepolitik/europaeische-energiepolitik,did=627026.html [03/07/2014].
7. IPCC, Climate Change 2014: Mitigation of Climate Change, Chapter 15, p. 55, http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter15.pdf [11/06/2014].

The quantities of CO_2 reduced in one place are emitted in other places outside the jurisdiction of the tax or feed-in compensation. This leads to a **displacement effect**.

Thus, it can be more cost-efficient for CO_2 emitters in other European countries to emit CO_2 rather than to invest in a CO_2 reduction technology.

The criticism of the Expert Commission on Research and Innovation of the Federal Government raised with regard to the EEG is clear[8]: due to the displacement effect the EEG did not contribute to climate protection and due to the feed-in compensation there was no incentive to develop innovative technologies. As the **EEG is not a cost-efficient instrument for climate protection** and does not show a measurable innovation effect, there was no justification for a continuation of the EEG.

The **Federal Ministry for Economic Affairs and Energy** argues that the EEG formed a basis for the development of renewable energies and "made them a supporting pillar of the German electricity supply with a share of 25% out of its niche existence"[9]. The latest EEG reform is planned to help expand renewable energies in order to take up a share of 40 to 45% in 2025 and a share of 55 to 60% in 2035.

1.6. Cost efficiency by means of European harmonisation of promotion programmes for renewable energies

The **German Council of Economic Experts** also argues in its working paper from June 2012[10] that additional promotion of electricity generation from renewable energies could only be achieved in a cost-efficient way by European harmonisation of promotion to be pursued in the medium term. **Ideally, emissions should only be limited by the trading of emissions rights**.

- Today, there are **more than 20 different feed-in compensations** for renewable energies in the EU. **Harmonisation would create temporary investment uncertainty.**
- The Federal Chancellor, Angela Merkel, criticised that the EU could not "question long-standing promotion systems without considering the creation of transitions" in the context of the debate about the Renewable Energies Act[11].

According to the Federal Government[12] **feed-in compensation totalling 120 billion EUR** was paid to the operators of renewable energy plants in Germany **from the introduction of the EEG in the year 2002 until the end of 2013**. The remunerated electricity quantity amounted to around 837 terawatt hours. Thus, operators received **14.3 cents per kilowatt hour on average**.

1.7. Development of electricity costs in Germany and energy costs in the EU

The EEG apportionment was increased from 5.3 cents per kilowatt hour to 6.24 cents in the period from 2013 to 2014. Thus, the electricity costs of an average household rose by around 35 EUR in 2014[13]. According to the Agora Energiewende and the Öko-Institut this increase is comprised as follows:

- **The addition of renewable energies** made up 0.44 cents (46%).

8. Expert Commission on Research and Innovation, "Gutachten zu Forschung, Innovation und technologischer Leistungsfähigkeit Deutschlands", http://www.e-fi.de/fileadmin/Gutachten_2014/EFI_Gutachten_2014.pdf, p. 51-52.
9. Federal Ministry for Economic Affairs and Energy, "EEG-Reform", http://www.bmwi.de/DE/Themen/Energie/Erneuerbare-Energien/eeg-reform.html [08/07/2014].
10. German Council of Economic Experts „Energiepolitik: Erfolgreiche Energiewende nur im europäischen Kontext", Arbeitspapier 03/2012, June 2012, http://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/download/publikationen/arbeitspapier_03_2012.pdf [17/06/2014].
11. FAZ.NET, „Merkel warnt vor Zerschießung des EEG", 25/06/2014, http://www.faz.net/aktuell/wirtschaft/wirtschaftspolitik/energiewende-merkel-warnt-vor-zerschiessung-des-eeg-13010362.html [07/07/2014].
12. Federal Government, „Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Bärbel Höhn, Oliver Krischer, Julia Verlinden, Peter Meiwald und der Fraktion BÜNDNIS 90/DIE GRÜNEN – Drucksache 18/165", 27/12/2013, http://dip21.bundestag.de/dip21/btd/18/002/1800242.pdf [18/08/2014].
13. Green Wiwo, „Energiewende: Wie Lobbyisten den steigenden Strompreis schön reden", 15/10/2013, http://green.wiwo.de/energiewende-wie-lobbyisten-den-steigenden-strompreis-schoenreden/ [18/08/2014].

- **The lower exchange prices for electricity** made up 0.36 cents of the increase (37%). When the electricity exchange price drops, the EEG apportionment rises, as the difference between the exchange price for electricity and the fixed feed-in compensation is balanced by the EEG apportionment.
- **Exemptions from the EEG apportionment for the industry** have an effect of 0.14 cents (15%).

While energy-intensive industries, such as the steel industry, complain that the burden of the EEG apportionment is too high[14], **the BUND states that energy-intensive industries are beneficiaries of renewable energies**[15]: The electricity exchange price drops due to the regenerative electricity being fed in. Industrial companies may benefit but they are mostly exempted from paying the EEG apportionment. Private households have to ease the burden for the industry in this way.

- The **EEG apportionment only amounts to one-fifth of the electricity price,** taxes and duties devise around 45% of the electricity price in total.
- One-third of the electricity price is attributed to **energy procurement and marketing.**
- Another 20% is incurred due to the **use of the electricity networks.**

The EU domestic market for energy was in a position to limit price increases for energy, however, for the time being energy prices within the EU will not be low in the international comparison[16]. **The Commission expects rising energy prices in the EU until 2020**. They are comprised of[17]:

- Rising costs for fossil fuels;
- Investments in infrastructure and generation capacities.

Falling energy prices are expected for the time after 2020, as fossil fuels will be replaced by renewable energies. On the other hand, investment costs will only slightly decrease, while taxes and duties, as well as costs for emission certificates, will increase.

1.8. Consequences of the price decline in the ETS in Germany: coal boom instead of efficient gas power plants and significant increase of renewable energies

New highly-efficient and climate-friendly gas power plants throughout Germany have generated less and less electricity or have even been completely decommissioned. This is a result of a **surplus of emission certificates** within the ETS, which is mainly due to the falling production after the economic crisis in 2009 and **low certificate prices**. In many cases, gas power plants were only built in the past few years and are now considered as failed investments; many public utility companies and major energy providers such as E.ON or RWE are suffering as a result.

As less coal is used in the United States as a result of the shale gas boom, the world market price for coal is significantly lower than the gas price. Furthermore, coal-fired power plants in Germany have been fully depreciated as opposed to gas power plants. **As the CO_2 price has declined, electricity generation from black and brown coal has been booming**. This is called the "merit order effect". The French consultancy, Sia Partners, anticipates that gas power plants will only become competitive at a certificate price of almost 36 USD[18]. A market simulation of the German electricity network operators revealed that at a CO_2 price of 93 EUR per tonne in 2024, electricity generation from brown coal would decline by one-third and electricity generation from black coal by almost two-thirds compared with the scenario of unmodified input data. However, electricity generated by gas power plants would double in this scenario[19].

14. Trade Association of the German Steel Industry, "Energiekosten-Explosion in der Stahlindustrie", 15/10/2013, http://www.stahl-online.de/index.php/medieninformation/energiekosten-explosion-in-der-stahlindustrie/ [18/08/2014].
15. BUND, „Energiewende Kosten fair teilen", http://www.bund.net/fileadmin/bundnet/publikationen/energie/121023_energie_fair_teilen_broschuere.pdf [18/08/2014].
16. Sami Andoura, "Agreed; but surely the basic problem is EU states' divergent energy policies", in: Europe's World, 15/06/2014, http://europesworld.org/commentaries/agreed-but-surely-the-basic-problem-is-eu-states-divergent-energy-policies/#.U_LvbfmqltH [19/08/2014].
17. European Commission, "Energy prices and costs in Europe", 29/01/2014, http://ec.europa.eu/energy/doc/2030/20140122_communication_energy_prices.pdf [19/08/2014].
18. Green Wiwo, „Energiewende: Wie der Kohleboom zu stoppen ist", 13/01/2014, http://green.wiwo.de/energiewende-wie-der-kohleboom-zu-stoppen-ist/ [17/06/2014].
19. German Transmission System Operators, „Sensitivitätenbericht 2014 der vier deutschen Übertragungsnetzbetreiber zur Sensitivität ‚CO_2-Preis'", http://www.netzentwicklungsplan.de/_NEP_file_transfer/Sensitivitaetenbericht_2014_Teil_II_CO_2-Preis.pdf [18/08/2014].

Environmental politicians argue that the latest EEG reform secured the continued existence of conventional power plants, particularly coal-fired power plants, at the expense of a slower expansion of renewable energies. The addition of green electricity is reduced by more than half when compared with trend levels. In this scenario green electricity will only make up 35% by 2020, which is only about 10% more than today. This will just replace the share of nuclear power and the operators of coal-fired power plants profit in this respect[20].

1.9. Ways to phasing out coal: cancellation of CO_2 certificates, "back loading" and "market stability reserve"

As the problem of increasing coal-based power generation is due to a surplus of ETS certificates, the **reduction of CO_2 certificates** could solve the problem. There are several proposals for this:

- The **cancellation of surplus certificates.**
- The so-called "**back loading**", in which the number of CO_2 certificates is not reduced but instead the certificates are **auctioned at a later point in time**, probably in the years 2019 and 2020. This applies to 900 million credits (for a tonne of CO_2 each); however, the **excess supply of CO_2 certificates is estimated at two billion**. This patch remains "without noticeable impact on CO_2 prices", states KfW economist Caroline Dieckhöfer[21].
- The **establishment of a "market stability reserve**". For the next trading period until 2030 a "market stability reserve" – a kind of **central bank for the climate** – will be established. If the surplus of emission rights is too high, which is the case in the current situation, the auctions for new certificates are held back. If the surplus declines too much, the reserves are released[22].

Prof. Martin Faulstich, Chairman of the German Advisory Council on the Environment, considers a **phasing out of coal-fired power generation in Germany by 2040** to be possible[23].

1.10. Conclusion

The EU set binding objectives for the expansion of renewable energy sources. The choice of specific technologies to achieve these objectives is up to the members states. The members states avail themselves of various national promotion programmes for the expansion of renewable energies. However, due to the simultaneous existence of the European Emissions Trading System these promotion programmes do not contribute to the reduction of CO_2 and lead to higher electricity prices, particularly in Germany as a result of the EEG. These additional costs could be limited by harmonising promotion programmes for renewable energies on the European level. However, such harmonisation of national promotion programmes goes hand-in-hand with the danger of temporary investment uncertainty. A crucial prerequisite for a Europeanisation of promotion programmes is the establishment of a European electricity network and a domestic market for energy. The "merit order effect" enabling the increasing share of coal used for electricity generation in Germany requires a European answer as well. By contrast, unilateral political decisions as part of the national energy transition – disregarding the existing interdependence between the members states may destabilise the entire European energy system[24]. The German energy transition may serve as a model but it cannot be copied one-to-one for the other members states[25].

20. Oliver Krischer, „Schwarz-Rote EEG-Novelle: Kohle profitiert und Klimaschutz verliert", http://oliver-krischer.eu/detail/nachricht/schwarz-rote-eeg-novelle-kohle-profitiert-und-klimaschutz-verliert.html [08/07/2014].
21. Manager Magazin, „EU plant eine Zentralbank fürs Klima", 11/10/2013, http://www.manager-magazin.de/politik/artikel/eu-kommission-will-zentralbank-fuer-co2-emissionshandel-a-927086.htm [24/07/2014].
22. Centre for European Policy, "Marktstabilitätsreserve für den Emissionshandel, cep Analyse Nr. 21/2014", http://www.cep.eu/fileadmin/user_upload/CEP-Analysen/Marktstabilitaetsreserve/cepAnalyse_COM_2014_20_ETS-Marktstablitaetsreserve.pdf [24/07/2014].
23. Handelsblatt, „Ein Pakt für den Kohleausstieg", 23/04/2014, http://www.handelsblatt.com/technologie/energie-umwelt/energie-technik/energiewende-ein-pakt-fuer-den-kohleausstieg/9794548.html [17/06/2014].
24. Sami Andoura, Jerzy Buzek, Jacques Delors, António Vitorino, "The European Energy Community is Now!", 21/05/2013, http://www.notre-europe.eu/media/energycommunitynow-andourabuzekdelorsvitorino-ne-jdi-may13.pdf?pdf=ok [18/08/2014].
25. Sami Andoura, "Agreed; but surely the basic problem is EU states' divergent energy policies", in: Europe's World, 15/06/2014, http://europesworld.org/commentaries/agreed-but-surely-the-basic-problem-is-eu-states-divergent-energy-policies/#.U_LvbfmqltH [19/08/2014].

2. EU domestic market for energy

According to Article 194(1) TFEU, the EU energy policy shall aim to:
- (a) ensure the functioning of the energy market, and
- (d) promote the interconnection of energy networks.

The Council of the EU decided in its meeting on 22 May 2013 that no member state should be cut off from the European gas and electricity network by 2015 anymore[26]. However, this objective cannot be reached according to the conclusions of the Council of the EU of 13 June 2014[27].

2.1. Liberalisation of the markets for electricity and gas

The creation of a liberalised market for electricity and gas has been on the agenda since the first EU directive on the gas market liberalisation of 1998. The **Third Energy Package of the EU** of 2009 led to the **separation of network operation from supply and generation** either through:
- ownership unbundling,
- independent network operators (ISO - Independent System Operator), or
- independent transmission system operators (ITO).

Germany opted for ownership unbundling regulated in Sect. 8 of the German Energy Act and there are also independent transmission system operators. However, liberalisation occurs **at different speeds in the various members states**, which is also the reason why it has yet to be completed[28].

2.2. Capacity market for conventional power plants?

In the course of the German energy transition the **relevance of fossil fuels will increase in the short term,** particularly during **peak times**, when the sun and wind cannot generate enough energy. This raises the question as to how the **capacities for energy supply from fossil fuels can be created** that are required for the transition to the era of renewable energies. **However, it is currently not worth investing in fossil power plants for energy suppliers**.

There are different ways to overcome electricity shortages[29]:
- **Price-based capacity mechanism:** The state pays power plant operators with particularly large capacities an additional annual premium per megawatt for a guaranteed period of time.
- **Quantity-based capacity mechanism:** The state determines the quantity required to bridge electricity shortages. Then an auction identifies who can provide these capacities most favourably.
- Norbert Allnoch, Director of the International Economic Forum for Renewable Energies, calls for an incentive system for a newly defined **flexibility market including storage technologies** and no capacity market.
  He states that Germany already has sufficient electricity generation capacities. According to him, the fundamental question is how quickly and flexibly the power plants can respond to the changing supply and demand situations[30].

26. Council of the EU, "Follow-up to the European Council of 22 May 2013: progress on the completion of the Internal Energy Market", 27/11/2013, http://www.parlament.gv.at/PAKT/EU/XXV/EU/00/38/EU_03887/imfname_10424694.pdf [07.07.2014].
27. Council of the EU, "Council conclusions on "Energy prices and costs, protection of vulnerable consumers and competitiveness"", 13/06/2014, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/143198.pdf [07/07/2014].
28. Sami Andoura, Leigh Hancher, Marc can der Woude, "Towards a European Energy Community: A Policy Proposal" (Paris, 2010).
29. Dena, "Übersicht Kapazitätsmechanismen", http://www.effiziente-energiesysteme.de/themen/strommarkt/kapazitaetsmechanismen.html [08/07/2014]; Christian Hübner, "Ordnungspolitische Perspektiven zur Bezahlbarkeit der Energiewende", in: [Konrad Adenauer Foundation] Analysen und Argumente (Berlin: 9/2012), http://www.kas.de/wf/doc/kas_32034-544-1-30.pdf?120919122920 [18/06/2014]. ; WWF, "Vergleich der derzeit für Deutschland vorgeschlagenen Kapazitätsmechanismen", September 2012, p. 7, http://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Kapazitaetsmechanismen.pdf [08/07/2014].
30. IWR, „Vattenfall widerspricht RWE und E.ON: Strom-Kapazitätsmarkt nicht notwendig", 24/03/2014, http://www.iwr.de/news.php?id=25906 [08/07/2014].

- Higher **electricity imports** from other European countries. In this respect an increased network expansion is required.

The German Energy Agency (**dena**) demands "a capacity market **determining the most cost-efficient output** to ensure security of supply **through Europe-wide tenders**. The tendering process should be **open to all kinds of technology** but specify **upper limits for CO_2 emissions** of power plants"[31].

The **CEO of RWE**, Peter Terium, argues in favour of a "**Europe-wide supply capacity market**"[32] and encourages an introduction of the model within the **Pentalateral Forum** founded in 2005[33]. Johannes Teyssen, **CEO of E.ON**, is also in favour of this solution[34], while **Vattenfall** backs EU-compatible national capacity mechanisms[35].

Philipp Vohrer, Managing Director of the **Agency for Renewable Energies**, takes a critical view of the capacity markets, stating that "In the interests of the climate protection objectives of the Federal Government, new policy instruments should absolutely be planned in such a way that no expensive promotion instruments for fossil power plants emerge which are not absolutely required for the security of supply". Several studies show that it is technologically possible to mobilise sufficient flexibilisation of potentials in the electricity system. Thus, extremely large shares of renewable energies up to a fully renewable electricity supply in 2050 could be realised[36].

2.3. Network expansion

A functioning domestic market for energy is only possible when the electricity and gas networks are expanded.

2.3.1. EU competences for the network expansion

According to **Article 172 TFEU**, the EU has the competence to expand the trans-European electricity and gas networks.

- The EU may become active in the **ordinary legislative procedure** having consulted the European Economic and Social Committee and the Committees of the Regions.
- Measures and projects relating to the **territory of a member state** require **its approval.**

Article 171(1) TFEU defines the measures that the EU may adopt taking into consideration the "potential economic viability of the projects":

- **Establishment of guidelines**: Objectives, priorities and broad lines of measures envisaged in the sphere of trans-European networks. Identification of **projects of common interest.**
- Measures necessary to ensure the **interoperability** of the networks, in particular in the field of **technical standardisation.**
- **Support for projects** of common interest **supported by the members states** through feasibility studies, loan guarantees or interest-rate subsidies. Resources from the **Cohesion Fund** (Article 177 TFEU) may be used for transport infrastructure projects in the members states.

Article 172 (2) TFEU stipulates that the Commission may take initiatives in close cooperation with the member states in order to coordinate national policy measures.

31. German Energy Agency, „dena plädiert für Kapazitätsmarkt", 20/11/2013, http://www.dena.de/presse-medien/pressemitteilungen/dena-plaediert-fuer-kapazitaetsmarkt.html [18/06/2014].
32. At an event of the Schwarzkopf Foundation in Berlin on 20 May 2014: http://www.eid-aktuell.de/2014/05/22/115429/ [18/06/2014].
33. The governments of Germany, France, Belgium, the Netherlands, Luxembourg and Austria closely cooperate with regulators, electricity exchanges and market players with the objective of a cross-border market coupling.
34. Spiegel Online, „E.on-Chef: Teyssen hält Atom- und Kohlestrom für kaum profitabel", 18/03/2014, http://www.spiegel.de/wirtschaft/soziales/e-on-chef-teyssen-haelt-atom-und-kohlestrom-fuer-kaum-profitabel-a-958458.html [08/07/2014].
35. Vattenfall, „Grundanforderungen an einen Kapazitätsmarkt nach 2020", http://corporate.vattenfall.de/newsroom/newsletter-energie-politik/grundanforderungen-an-einen-kapazitatsmarkt-nach-2020/ [08/07/2014].
36. Agency for Renewable Energies, „Vergleich energiewissenschaftlicher Studien zeigt große Unsicherheiten hinsichtlich Kapazitätsmechanismen", http://www.unendlich-viel-energie.de/presse/nachrichtenarchiv/2013/vergleich-energiewissenschaftlicher-studien-zeigt-grosse-unsicherheiten-hinsichtlich-kapazitaetsmechanismen [08/07/2014].

Article 172 (3) TFEU entitles the EU to make decisions to cooperate with third countries in order to promote projects of common interest and to secure the interoperability of the networks.

A core project of the EU Commission is the **acceleration of the approval procedure for cross-border infrastructure projects**, which shall take a maximum of three years. Every member state may name **one competent authority** as a point of contact for the entire approval process[37].

The EU has failed to achieve its self-imposed goals concerning the network expansion so far. The Council of the EU decided in its meeting on 22 May 2013 that no member state should be cut off from the European gas and electricity network by 2015[38]. However, this objective cannot be reached according to the conclusions of the Council of the EU of 13 June 2014[39].

2.3.2. Expansion of the electricity network

Particularly in the course of the German energy transition the expansion of the European electricity network is of high importance:

- **As the networks transport electricity irrespective of the actual need**, wind park output has to be cut more and more often in case of surpluses, in order to keep the network stable. Electricity that is not fed into the network is still compensated in accordance with the EEG Feed-In Regulation[40].
- **Volatility problem**: Sun and wind are not permanently available and sufficient storage is presently not possible[41].

A well-developed network for high-voltage DC transmission (HVDC) is required in order to transport surplus energy to other countries and to transport wind energy from the north and solar energy from the south to regions with a demand for electricity.

2.3.3. Expansion of the gas network

As a result of the escalation of the meanwhile third gas dispute between Russia and Ukraine since 2006, the trans-European expansion of the gas network returned to the forefront as an element of European security of supply. This particularly refers to:

- The **integration of regions that have not been connected to the European gas network,** especially in the Baltics and Eastern Europe. There have only been few market incentives to invest in networks in these Gazprom monopoly regions.
- The **facilitation of physical "reverse flows",** i.e. the operation of pipelines in reversed direction in order to supply Eastern Europe in the case of supply interruptions in the Russian pipelines.

2.3.4. Network expansion players

The network expansion in the EU is **primarily a responsibility of private network operators**. This **bottom-up process** is dominated by **national regulation** and **national incentive systems** and financial interests of network operators. Network expansion is only coordinated on a European level.

37. EurActiv.de, "Schnellverfahren und EU-Förderung für Energienetz", http://www.euractiv.de/energie-und-klimaschutz/artikel/schnellverfahren-und-eu-frderung-frs-energienetz-005512 [08/07/2014].
38. Council of the EU, "Follow-up to the European Council of 22 May 2013: progress on the completion of the Internal Energy Market", 27/11/2013, http://www.parlament.gv.at/PAKT/EU/XXV/EU/00/38/EU_03887/imfname_10424694.pdf [07.07.2014].
39. Council of the EU, "Council conclusions on "Energy prices and costs, protection of vulnerable consumers and competitiveness"", 13/06/2014, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/143198.pdf [07/07/2014].
40. Prof. Eicke R. Weber, "'Bedeuten mehr Speicher weniger Netzausbau?'", in: Federal Ministry for Economic Affairs and Energy, Energiewende direkt, Ausgabe 18/2014, June 2014, http://www.bmwi-energiewende.de/EWD/Redaktion/Newsletter/2014/18/Meldung/kontrovers-bedeuten-mehr-speicher-weniger-netzausbau.html [08/07/2014].
41. Prof. Eicke R. Weber, "'Bedeuten mehr Speicher weniger Netzausbau?'", in: Federal Ministry for Economic Affairs and Energy, Energiewende direkt, Issue 18/2014, June 2014, http://www.bmwi-energiewende.de/EWD/Redaktion/Newsletter/2014/18/Meldung/kontrovers-bedeuten-mehr-speicher-weniger-netzausbau.html [08/07/2014].

2.3.4.1. European Network of Transmission System Operators for Electricity (ENTSO-E)

The **Regulation (EC) No. 714/2009** of 13 July 2009 entitled the ENTSO-E to competences concerning the expansion of the EU's electricity network. **More than 30 transmission network operators** are members of the ENTSO-E throughout Europe; the German members are TransnetBW, Tennet TSO, Amprion, and 50Hertz Transmission. The **Third Energy Package of the EU** laid down the competences of the ENTSO-E:

- In two-year intervals, the ENTSO-E publishes **a ten-year plan for the network expansion.** The first report was published in 2010 and the publication of the "Ten-Year Network Development Plan 2014" is planned for December 2014.
- Development of **network codes.**
- Securing network **interoperability.**
- Publication of **reports on electricity generation.**

ENTSO-E closely cooperates with the European Agency for the Cooperation of Energy Regulators (ACER).

2.3.4.2. European Network of Transmission System Operators for Gas (ENTSO-G)

ENTSO-G was created in 2009 within the scope of the Third EU Energy Package passed in 2007 to liberalise the opening of the electricity and gas markets in Europe. In accordance with **Regulation (EC) No. 715/2009** ENTSO-G has the following competences:

- working out an **EU-wide ten-year plan for the development of the gas network,**
- standardisation, awarding, and administration of **network codes,**
- improvement of the **information flow** from the transmission network operators to the market participants, and
- establishment of common tools in order to **coordinate the network operation.**

39 transmission system operators are organised under ENTSO-G. They include Bayernets, Gascade, GTG Nord, Gasunie Deutschland, GRTgaz Deutschland, Jordgas, Nowega, Ontras, Open Grid Europe, Terranets BW and Thyssengas from Germany. ENTSO-G closely cooperates with the European Agency for the Cooperation of Energy Regulators (ACER).

2.3.4.3. European Agency for the Cooperation of Energy Regulators (ACER)

ACER was established on the basis of the **Regulation (EC) No. 713/2009** in 2009. It is a decentralised agency of the EU. ACER is responsible for:

- **assessment of ten-year plans by** ENTSO-E and ENTSO-G,
- **providing advice** on energy issues **to the EU bodies**,
- **coordination** of the work of **national energy regulation authorities** (e.g. Federal Network Agency and E-Control),
- and participation in the **development of European network rules**.

National regulators can delegate decision-making authorities to ACER.

2.3.5. Financing of the network expansion

In 2011, the EU Commission expected a **financing requirement** of approx. **200 billion EUR** for the construction of **gas pipelines and electricity networks** in the EU **for the next ten years**[42].

- **140 billion EUR** for high-voltage DC transmission networks, electricity storage, and smart-grid applications;
- **70 billion EUR** for gas pipelines, gas storage, liquefied natural gas (LNG) terminals and a reverse flow infrastructure;
- **2.5 billion EUR** for the transport infrastructure for carbon dioxide.

42. European Commission, "European Commission - MEMO/11/710", 19/10/2011, http://europa.eu/rapid/press-release_MEMO-11-710_en.htm?locale=en [19/06/2014].

The Commission expects that 100 billion EUR can be raised by the market and, therefore, a financing gap of 100 billion EUR would remain[43]. Rebecca Harms, MEP of the Green Group in the European Parliament, criticises that the investment plans of the Commission prefer the expansion of gas pipelines and disadvantage the required, sustainable infrastructure for renewable energies[44].

The EU provides various development funds to finance the network expansion. However, as a general principle, financial support constitutes an exception and the **construction and maintenance of the energy infrastructure have to be subject to market principles**[45].

2.3.5.1. Trans-European Energy Networks (TEN-E)

The **Regulation (EC) No. 1364/2006** stipulated guidelines for trans-European energy networks. This regulation differentiates between "projects of common interest", "priority projects", and "projects of European interest". The **budget of the TEN-E** amounts to around **20 million EUR** per year and is primarily invested in **feasibility studies**.

2.3.5.2. Connecting Europe Facility

The "Connecting Europe" facility was established together with the **Regulation (EU) No. 1316/2013** and provides funds for the expansion of the **energy networks** and also transport and digital networks within the EU. **5.85 billion EUR** will be provided for an improvement of the trans-European energy infrastructure for the **period 2014-2020**.

A project has to be included in the so-called list of **projects of common interes**t so that an **application for funding** can be submitted. The list of 2013 contains around 250 significant energy infrastructure projects with at least the following advantages after their conclusion:

- they yield significant benefits to two member states,
- they improve the security of energy supply,
- they strengthen market integration and competition, and
- they lead to a reduction of CO_2 emissions.

Every construction project requires a **decision of the competent national regulation authorities** or the **Agency for the Cooperation of Energy Regulators** (ACER) about the cross-border cost sharing. The **amount of EU financing** may generally not exceed **50 percent of the eligible costs**[46].

2.3.5.3. European Investment Bank (EIB)

The European Investment Bank had a **budget amounting to 75 billion EUR to promote TEN projects** in the field of transport and energy in the years **2004-2013**. Moreover, the EIB also supports infrastructure projects that are not included in the TEN. The support instruments include[47]:

- **loans** - particularly for the network expansion,
- **funds** - particularly for energy efficiency and fund participations, especially with regard to emissions trading,
- **partnerships with other investors** - e.g. for the Mediterranean Solar Plan,
- **support** - for research and development, and
- joint **initiatives with the Commission** - e.g. for energy efficiency projects.

43. European Commission, "Energieinfrastrukturprioritäten bis 2020 und danach - ein Konzept für ein integriertes europäisches Energienetz"; KOM(2010) 677, 17/11/2010, http://www.europarl.europa.eu/meetdocs/2009_2014/documents/com/com_com(2010)0677_/com_com(2010)0677_de.pdf S. 9, [08/07/2014].
44. EurActiv.de, „Schnellverfahren und EU-Förderung für Energienetz", 19/10/2011, http://www.euractiv.de/energie-und-klimaschutz/artikel/schnellverfahren-und-eu-frderung-frs-energienetz-005512 [08/07/2014].
45. Summaries of EU legislation, "Trans-European energy networks", http://europa.eu/legislation_summaries/energy/internal_energy_market/l27066_en.htm [19/06/2014].
46. European Commission, "European Commission - IP/14/547", 12/05/2014, http://europa.eu/rapid/press-release_IP-14-547_de.htm [19/06/2014].
47. European Investment Bank, "Energie", http://www.eib.org/projects/priorities/energy/index.htm [19/06/2014].

2.3.5.4. Cohesion Fund

About **63.4 billion EUR** are provided for infrastructure projects in the **period 2014-2020** from the Cohesion Fund. They are used for:

- **Energy and transport projects** if they provide substantial benefits to the environment by means of
  - energy efficiency,
  - the use of renewable energies,
  - the expansion of the rail network,
  - improved transport connections,
  - support for public transport etc.
- **Trans-European transport networks**, particularly for "projects of European interest". The Cohesion Fund supports infrastructure projects within the scope of the facility "Connecting Europe".

2.4. Conclusion

In the course of expanding renewable energies peak-load problems arise: When there is not enough solar or wind energy, electricity supply depends on flexible conventional power plants or electricity imports due to the nuclear phase-out in the Federal Republic of Germany. As investments in conventional power plants are currently not profitable for private-sector energy suppliers, various capacity market models are being discussed in which energy suppliers would be paid for the provision of power plant capacities, particularly the private sector advocates of a European solution. A European capacity market for conventional power plants would require an expansion of the trans-European electricity network in the same way as the increased import of electricity.

The expansion of the electricity network is particularly necessary due to the German energy transition and the Europe-wide expansion of renewable energies. Germany notably faces the volatility problem in both ways. The first is that electricity imports or the output of conventional power plants are required if renewable energies do not generate sufficient electricity. The second is that consumers occasionally have to pay for electricity consumption as the possibilities to store electricity are still limited when renewable energies generate too much electricity. Therefore, the network expansion should make sure that excess electricity can be sold to neighbouring European countries.

The gas network also requires trans-European expansion in order to ensure security of supply and balance possible supply disruptions, especially in Eastern Europe, which is highly dependent on Russian gas supply. This dependency also pertains to the facilitation of physical reverse flows as they are currently being discussed for Ukraine.

The network expansion in the EU is primarily a responsibility of private network operators. This bottom-up process is dominated by national regulation and national incentive systems and financial interests of network operators. Transnational network expansion is only coordinated on European level. The EU adopts guidelines and prioritises "projects of common interest", "priority projects", and "projects of European interest", and then takes measures to ensure the interoperability of the networks with regard to the harmonisation of technical standards.

In 2011, the EU Commission estimated a financing need of approx. 200 billion EUR for the construction of gas pipelines and electricity networks in the EU in the next ten years. The EU provides various funds to finance the network expansion and supports projects of the member states with a common interest by means of feasibility studies, loan guarantees, or interest-rate subsidies. However, as a general principle, financial support constitutes an exception and the construction and maintenance of the energy infrastructure have to be subject to market principles. The EU instead provides limited funds. Current objectives, such as the integration of isolated member states in the European electricity and gas network by 2015 have yet to be achieved.

The liberalisation of markets for electricity and gas was driven by the Third Energy Package of the EU adopted in 2009, however, it has been run at different speeds for the respective member states. The completion of the domestic market liberalisation still remains an important task and the establishment of a competitive and liquid domestic market for energy should be the objective. The way to achieving this objective could lie in the harmonisation of regulation for renewable energies, transmission, and energy trading[48].

48. Notre Europe, European Economic and Social Committee, "Joint responses to energy challenges through a European Energy Community", 21/02/2012, http://www.eesc.europa.eu/resources/docs/declaration-en.pdf [19/08/2014].

3. EU foreign energy policy

Since the outbreak of the crisis in Ukraine and the new gas dispute between Russia and Ukraine questioning the security of gas transits to Europe, the **secure supply of the member states with gas** took on more prominence in the European energy debate. Moreover, the EU has to set an emissions reduction goal for 2030 in the new round of UN climate negotiations.

3.1. EU competences in external energy policy

According to **Article 194(1) TFEU**, the EU pursues the objective of **ensuring the security of energy supply** within the Union. Furthermore, it shall contribute to the pursuit of **promoting measures at an international level to deal with** regional or **worldwide environmental problems**, and in particular **combating climate change in accordance with Article 191(1)(d) TFEU**. For example, the EU may conclude international treaties on energy and environmental protection.

3.2. International climate negotiations

By March 2015 UN members states can set their objectives on greenhouse gas emissions for the period until 2030 in the latest round of UN climate talks. Currently, there is talk of **a reduction target of 27 to 28 percent for 2030** by the EU Commission[49]. Moreover, the EU offers the increase of its official **emissions reduction** target **until 2020 by 20 to 30 percent**, if other major economies make similar reasonable efforts[50]. The President of the European Commission, José Manuel Barroso, speaks out against energy saving targets and in favour of an orientation of climate protection to emissions trading alone[51].

The **members states** are currently **divided in the debate about new climate objectives.** While environmental protection is a central issue for Western and Northern Europeans, Eastern Europeans attach more importance to the security of supply and low energy prices. Commentators assume that Eastern Europeans want to include a revision clause in the climate negotiations as of 2015. Thus, Europe should lower its ambitions unless other industrial and emerging countries make similar commitments.

3.3. Security of gas supply

Natural gas plays an important role as bridging technology in the transition to renewable energies. However, two thirds of the gas used in the EU has to be imported from outside the EU. Therefore, the security of gas supply has a foreign policy dimension. An EU-wide stress test on the security of gas supply for next winter is currently being implemented. The objective is to find out which consequences Russian delivery interruptions would have on the EU.

3.3.1. Few diversified source of supply, particularly in Eastern Europe

According to ENTSO-G[52] the **EU** had a **total gas consumption of 5,015,227 GWh in 2012**.

- The EU obtained the biggest share of its gas, **30.7%** from **own reserves.**
- **27.1%** of the gas was imported from **Russia.**

49. FAZ.NET, „EU will mehr Energie sparen", 20/06/2014, http://www.faz.net/aktuell/wirtschaft/wirtschaftspolitik/eu-schmiedet-ehrgeizigere-plaene-zur-energie-effizienz-12999172.html [20/06/2014].
50. Representation of the European Commission in Germany, „UN-Klimaverhandlungen in Bonn: EU für ehrgeiziges, globales Handeln", 04/06/2014, http://ec.europa.eu/deutschland/press/pr_releases/12421_de.htm [20/06/2014].
51. FAZ.NET, „EU will mehr Energie sparen", 20/06/2014, http://www.faz.net/aktuell/wirtschaft/wirtschaftspolitik/eu-schmiedet-ehrgeizigere-plaene-zur-energie-effizienz-12999172.html [20/06/2014].
52. Gas Infrastructure Europe, "ENTSOG / GIE - System Development Map 2012 ", http://www.gie.eu/download/maps/ENTSOG_SYSDEV_MAP2012.pdf [20/06/2014].

- **22.7%** from **Norway.**
- **11.7%** of the gas was transported by tanker from various supply sources in the form of **liquefied natural gas** (LNG).
- **6.6%** of the gas was supplied from **Algeria.**
- **1.3%** of the gas was imported from **Libya.**

The **dependence** on external gas suppliers, particularly Russia, **varies considerably**. In **Eastern Europe and**, above all, in the **Baltics, Russia is almost the only supplier of natural gas**. Central Europe procures significantly less Russian natural gas; Southern and Western Europe procure almost no gas from Russia. By way of illustration, Poland's and Germany's gas imports in the year 2012 are shown for comparison.

Poland consumed a total of **17.18 billion cubic metres of gas in 2012**[53].

- Poland received 13.1 billion cubic metres of **gas from Russia**[54]**,** which makes up about **76% of the Polish gas consumption** in 2012.
- **Poland produced 6.25 billion cubic metres of gas itself**[55], which slightly reduced the dependence on gas imports from Russia. However, the gas production volumes are declining in Poland.

Poland imported a total of **37.2 billion cubic metres of gas in 2012** according to ACER.

- The largest supply, 35.5 billion cubic metres of gas, was **imported from Russia.** It was transported from Russia via Belarus and Ukraine to Poland through the "Yamal-Europe Pipeline".
  13.1 billion cubic metres of gas went to **Poland.**
  25 billion cubic metres of gas were **passed on to Germany** through Poland.
- Poland imported 0.6 billion cubic metres of **gas** from the Czech Republic.
- 1.1 billion cubic metres of gas came from Germany.
- Poland also stored a certain quantity of gas that is not known to the author.

Germany consumed 86 billion cubic metres of gas in the year 2012.

- The Federal Republic of Germany received **34 billion cubic metres of gas from Russia**[56]**.** This makes up **40% of the natural gas consumption** of the Federal Republic of Germany in 2012.
- 11.3 billion cubic metres of gas came directly from Russia via the **Nord Stream Pipeline**, according to ACER.
- The remaining supply from Russia was distributed among the **"Yamal-Europe Pipeline"** via Belarus and Poland and the **"Brotherhood Pipeline"** via Ukraine, Slovakia, and the Czech Republic.

In contrast, **German gas imports from non-Russian sources** amounted to **103.7 billion cubic metres of gas** in 2012.

- Gas supply from **Norway** totalling 49.5 billion cubic metres was on the top of the list.
- Followed by 44.5 billion cubic metres of gas delivered to Germany via the **Netherlands.**
- Further supply came from **Austria, Belgium** and **Denmark.**

In addition, Germany had its **own gas production, amounting to 14.83 cubic metres of gas** in 2012[57]. However, the production volumes have declined. The Federal Republic of Germany **exported** or passed on **62.2 billion cubic metres of gas**. A certain quantity of gas was stored that is not known to the author.

53. U.S. Energy Information Administration, "Poland", http://www.eia.gov/countries/country-data.cfm?fips=pl#ng [15/07/2014].
54. Gazprom, "Press Conference Background Gas export and enhancing reliability of gas supply to Europe", 04/06/2013, http://www.gazprom.com/f/posts/86/961749/background-press-conf-2013-06-04-en.pdf [16/07/2014].
55. U.S. Energy Information Administration, "Poland", http://www.eia.gov/countries/country-data.cfm?fips=pl#ng [15/07/2014].
56. Gazprom, "Press Conference Background Gas export and enhancing reliability of gas supply to Europe", 04/06/2013, http://www.gazprom.com/f/posts/86/961749/background-press-conf-2013-06-04-en.pdf [16/07/2014].
57. U.S. Energy Information Administration, "Germany", http://www.eia.gov/countries/country-data.cfm?fips=GM&trk=m [16/07/2014].

3.3.2. Varying prices for Russian gas in the member states of the EU / political prices? / prohibition of resale of gas

The Russian gas supplier **Gazprom negotiates gas prices with individual consumer states on a bilateral level**. The **agreements are kept in secrecy**, the gas prices of individual countries are only stated in exceptional cases, however, there are estimates[58]. **Gazprom normally links the gas price to the oil price** and reflects its changes in the gas price with a delay of around six months. Germany and Italy could negotiate that up to 15% of their gas prices are based on the spot market prices for gas[59].

The average **export price for Russian gas to Europe** amounted to **346 USD per 1,000 cubic metres in 2011**[60]. The **base price** for the separate supply agreements is individually set **by Gazprom** for every consumer. The higher the percentage of Russian gas in the consumption of the respective consumer - the higher the dependence on Russian gas supply - the higher the gas price[61].

Particularly with regard to the current conflict in Ukraine, the **question arises as to whether the price for Russian gas is politically determined**. Ukraine received a price of 260 USD per 1,000 cubic metres of gas under the pro-Russian Ukrainian government of Viktor Yanukovych; Russia tried to raise the price to 460 USD per 1,000 cubic metres when pro-Western forces came to power after the overthrow of Yanukovych's government. Then **Russia suspended gas supply to Ukraine on 16 June 2014**, after Ukraine refused Russia's last offer of 385 USD per 1,000 cubic metres in mid-June. The transit gas quantities for the Western neighbours of Ukraine are exempted from this export stop.

Some of the **agreements** that Gazprom concludes with its consumers contain a **prohibition of resale of Russian gas to third parties**. Thus, the idea of the "reverse flow" for the purpose of supply of strongly import-dependent states in Eastern Europe is partially thwarted. Gazprom's CEO Alexey Miller pointed out on 5 April 2014 that such transactions were "legally questionable" from his point of view[62].

3.3.3. Negotiation mandate for the European Commission to revise agreements with Gazprom / Commission as a central gas buyer

Two aspects of the current **debate on a European Energy Union**, encouraged by Poland's Prime Minister Donald Tusk, are paramount:

1. The **strengthening of the negotiating mandate of the European Commission** to revise agreements with Gazprom:
   - To **remove** clauses containing the **prohibition of resale of gas** or **take or pay clauses**, or
   - To end **linking the oil price to the gas price** in order to achieve lower import prices.

   The German groups E.ON and RWE could already push through a relaxation of the oil price link in negotiations with Gazprom[63].

2. Furthermore, Poland in particular encourages the idea that the **European Commission or a subordinated agency should bundle European gas purchases** in order to strengthen the negotiating position of smaller member states towards Gazprom.

3. **EU Energy Commissioner, Günther Oettinger,** has, so far **rejected this proposal.** "There will be no politically directed standard price for me", he told Frankfurter Allgemeine Zeitung on 14 May 2014[64].
   - Instead he relies on the **expansion of the pipeline network** in order to smoothly transport gas between the EU countries.
   - This would **automatically harmonise the still rather varying competitive prices** and Russia could no longer play off countries against each other.

58. Radio Free Europe, "Gazprom's Grip: Russia's Leverage over Europe", http://www.rferl.org/contentinfographics/gazprom-russia-gas-leverage-europe/25441983.html [15/07/2014].
59. Adnan Vatansever, "The Future of EU-Russian Energy Relations", in: [Atlantic Council, David Koranyi (ed.)]: A Eurasian Energy Primer: The Transatlantic Perspective, (Washington DC, November 2013), p. 37-50, here: 44.
60. Focus.de, „Gazprom kündigt Preiserhöhung an", 25/04/2011, http://www.focus.de/finanzen/finanz-news/gaspreise-gazprom-kuendigt-preiserhoehung-an_aid_621346.html [20/06/2014].
61. Reuters, „Oettinger will Einheitspreis für russisches Gas in EU", 02/05/2014, http://de.reuters.com/article/domesticNews/idDEKBN0DI0Y920140502 [20/06/2014].
62. Ria Novosti, „Gazprom-Chef: Reverse Flow-Modus für Gaslieferungen aus Europa in Ukraine rechtlich fraglich", 05/04/2014, http://de.ria.ru/business/20140405/268211513.html [20.06.2014].
63. Welt Online, „Gazprom rückt offenbar von der Ölpreisbindung ab", 21/06/2012, http://www.welt.de/wirtschaft/energie/article106640648/Gazprom-rueckt-offenbar-von-der-Oelpreisbindung-ab.html [20/06/2014].
64. FAZ.NET, „Oettinger erteilt Energieunion Absage", 14/05/2014, http://www.faz.net/aktuell/wirtschaft/wirtschaftspolitik/eu-energiekommissar-oettinger-erteilt-energieunion-absage-12939975.html [20/06/2014].

- **Neighbouring countries**, such as Ukraine and Moldova, **should be better integrated** according to Oettinger.

The **Council of the EU adopted a vaguely formulated resolution** for the strengthening of the Commission in questions of external energy relations **at its meeting on 13 June 2014**. "The Council encourages the Commission to examine ways to strengthen the bargaining power of the EU and its Members States vis-a-vis external suppliers"[65].

In the **EU Energy Security Strategy** of 28 May 2014, the Commission encourages a review of the "**voluntary mechanisms for demand aggregation**" that might lead to a stronger negotiating position of European buyers[66].

3.3.4. Creation of a strategic gas reserve

The creation of a national gas reserve is currently being discussed in Germany due to fears of delivery interruptions in the course of the crisis in Ukraine. The **Bavarian State Government** is in special support of this idea. Analogous to the strategic oil reserve established in 1973, Germany shall be able to **provide itself with gas for up to 90 days**.

Regulation (EU) No. 994/2010 has at this point required gas suppliers to **securely ensure supply at any time during a 30-day cold spell** through measures for the assurance of secure natural gas supply. However, the companies are not obliged to build up physical stocks. For example, they may also provide evidence of the security of supply by presenting import agreements. According to the **German Association of Energy and Water Industries** (BDEW), a national **gas reserve** is **unnecessary** due to the existing legal provisions on the security of gas supply[67].

FIGURE 1 ► European gas transmission network

Source: Oxford Institute for Energy Studies; marked by the author.

65. Council of the EU, "Council conclusions on "Energy prices and costs, protection of vulnerable consumers and competitiveness"", http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/143198.pdf [07/07/2014].
66. European Commission, „Strategie für eine sichere europäische Energieversorgung", 28/05/2014, http://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:52014DC0330&from=EN [18/08/2014].
67. Welt Online, „Nationale Gasreserve für Deutschland gefordert", 13/03/2014, http://www.welt.de/wirtschaft/article125740892/Nationale-Gasreserve-fuer-Deutschland-gefordert.html [20/06/2014].

3.3.5. Diversification of gas supply sources and delivery routes

In addition to strengthening the domestic energy market by expanding the networks and enhancing the negotiation position of the Commission towards gas exporters, **the EU has pursued a diversification strategy** for gas procurement sources and supply routes **since the first gas crisis between Russia and Ukraine.**

A successful diversification strategy primarily requires **security of demand**. Without clear common EU climate and energy objectives the development of demand in fossil fuels - especially in grid-bound natural gas - will remain unclear.

A **well-expanded inner-European pipeline network is also required** so that the liquidity of gas supply does not always depend on external players. "Liquefied natural gas (LNG) from Qatar or the USA, and natural gas from Norway or Azerbaijan, have to be at the right place at the right time, and in the right quality in which they are needed", states Kirsten Westphal, from the Stiftung Wissenschaft und Politik[68].

3.3.5.1. Foreign policy dimension of the gas market liberalisation: the South Stream controversy

The liberalisation of the gas market also has a foreign policy dimension. On the basis of the Third Energy Package the EU Commission most recently stopped the construction of the Bulgarian section of the **South Stream Pipeline** planned to transport gas from Russia through the Black Sea to the Balkans. The reason for this is because the Russian energy producer **Gazprom owns the pipeline network** in accordance to the underlying bilateral treaties concluded before the finalisation of the Third Energy Package. This violates the **unbundling specifications** of the Third Energy Package. Russia considers this an artificial barrier violating WTO rules and wants to **file a suit with the WTO**.

At one point there was a talk of a "**Gazprom clause**" within the EU, which should **prohibit** companies with restrictive market access conditions in their home countries **to buy themselves into the liberalised European energy sector**. However, it was not realised.

The Federal Government has recently approved the **takeover of the RWE subsidiary DEA by the investment company "Letter One"** behind which the Russian investor Mikhail Fridman stands. Besides the BASF subsidiary Wintershall **DEA** is the only larger **German oil and gas exploration company** and has numerous exploration and production licences in Europe.

3.3.5.2. Alternative pipelines, "Southern Gas Corridor": Trans-Adriatic Pipeline, Nabucco

In competition with the Russian South Stream Pipeline the EU advances the "**Southern Gas Corridor**". This includes **infrastructure projects for the transport of gas from the Caspian region to the EU**. The Azerbaijani Shah Deniz gas field is in the forefront. It has reserves of **50 to 100 billion cubic metres of gas**.

The production of the **Shah Deniz Consortium** consisting of the companies BP (Great Britain, 25.5% participation), Statoil (Norway, 25.5%), TPAO (Turkey, 19%), SOCAR (Azerbaijan, 10%), Lukoil (Russia, 10%), NOCC (Iran, 10%) started in the year 2006. The gas is transported **from Azerbaijan to Turkey** via the **South Caucasus Pipeline**.

Two major pipeline projects competed for the transport of Caspian gas to the EU: the **Nabucco Pipeline** and the **Trans Anatolian Pipeline (TANAP),** which was finally awarded the contract particularly due to the stance taken by Turkey.

68. Kirsten Westphal, „Deutschland braucht eine neue Energie-Außenpolitik", in: Euractiv.de, 28/03/2014, http://www.euractiv.de/sections/energie-und-umwelt/deutschland-braucht-eine-neue-energie-aussenpolitik-301218 [07/07/2014].

- The Trans Anatolian Gas Pipeline is planned to transport **gas from Azerbaijan to the Turkish-Greek border,**
- from where it will be transmitted through Greece and Albania to Italy via the Trans Adriatic Pipeline (TAP).
- **Azerbaijan is a majority shareholder of the Trans Anatolian Pipeline (TANAP)** with 51% and thus controls the gas transit to Turkey.
    - Therefore, **Azerbaijan is in a position** to **allow or refuse the feed-in of additional gas** quantities from other sources - the EU in particular speculates on the feed-in of Turkmen gas.
    - Moreover, Azerbaijan may set the **transit fees.**

This massive **control of the gas transit** in the "Southern Gas Corridor" by Azerbaijan diametrically **opposes the unbundling of producers and transmission network operators** pushed within the EU. Koranyi and Sartori indicate that Azerbaijan has a powerful position concerning the gas transit through Turkey, which Gazprom also tried to attain with regard to the Ukrainian transit for two decades without success[69]. The EU may diversify its gas procurement and render itself less dependent on Russian imports. However, it creates **new dependencies**.

3.3.5.3. Turkmenistan, Eastern Mediterranean

The EU is particularly interested in establishing a **Trans Caspian Pipeline from Turkmenistan through the Caspian Sea to Azerbaijan** in order to transport gas to Europe via the Trans Anatolian Pipeline (TANAP) and the Trans Adriatic Pipeline (TAP). However, Azerbaijan being the majority shareholder would have to consent to a feed-in into TANAP.

The **700 cubic metres of gas** discovered in the **Eastern Mediterranean** might **only slightly influence the supply situation in the EU** due to the high energy demand in Turkey - the more so as Azerbaijan would also have to consent to the feed-in of this gas into TANAP.

3.3.5.4. Liquefied Natural Gas (LNG)

The EU currently has **20 operating LNG terminals**[70], however, the expansion of the LNG infrastructure has made hardly any progress in Germany. A well-expanded inner-European pipeline **network is required** for the import of LNG on a grand scale.

Possible exporters of LNG are the **United States and Canada**[71].

- However **Canada still requires a good decade to expand its infrastructure** as the gas is produced in western Canada but would have to be exported via the east coast to Europe,
- Currently Canada is facing **resistance against the required transit pipeline** from both the Aborigines, and environmental groups as well as some of the provinces.
- The **political will to export gas is rather low** in the **USA** although the Obama administration spoke out in favour of the LNG export in the course of the Crimean crisis.

Another problem is the fact that the **high demand for LNG in Asia drives up the prices**. European importers would have to pay double the price for pipeline gas with regard to LNG. Furthermore, the spot market for LNG is extremely small and many contracts on the supply of new **liquefied gas quantities** have **already been concluded for the long term**[72].

69. David Koranyi, Nicolò Sartori, "EU-Turkish Energy Relations in the Context of EU Accession Negotiations: Focus on Natural Gas", [Atlantic Council Dinu Patriciu Eurasia Center and Istituto Affari Internazionali (IAI)], http://www.atlanticcouncil.org/images/publications/GTE_WP_05.pdf [20/06/2014].
70. Gas Infrastructure Europe, «LNG Map», http://www.gie.eu/index.php/maps-data/lng-map [20/06/2014].
71. Sophia Côte, "EU Natural Gas Diversification: Assessing Canada and the US as Potential Suppliers of Natural Gas to the EU", [Master's dissertation at Hertie School of Governance], (Berlin: 2014).
72. Capital, „Teurer Abschied von Russland", 22/04/2014, http://www.capital.de/themen/teurer-abschied-von-russland.html [20/06/2014].

On the whole, **LNG** is **no general alternative to Russian gas import**s due to the prices and existing capacities and infrastructure, despite the possibility of the expansion of the infrastructure in Eastern Europe bringing a more favourable position in price negotiations to member states. Poland is currently constructing its first LNG port at the German-Polish border in Świnoujście. Moreover, it is possible to balance short-term supply interruptions in pipelines with LNG deliveries in the future.

3.3.5.5. Shale gas extraction ("fracking")

The EU Commission adopted a **recommendation on environmental standards for hydraulic fracturing processes**[73] on 22 January 2014 in which water and chemicals are pressed into rock formations in order to extract shale gas. These recommendations are not binding. The extraction of shale gas could **partially replace the declining conventional extraction of natural gas** in Europe and thus make a contribution to the security of supply, competitiveness and climate protection. Above all, Eastern European members states have high hopes for energy generation from shale gas.

Various federal states launched Federal Council initiatives for fracking in **Germany**. The Federal Ministry for the Environment and the **Federal Ministry for Economic Issues and Energy** now presented their own **key points on fracking**. According to them, the extraction method from rock layers as deep as 3,000 metres shall be largely prohibited for the time being. Any type of fracking in water protection and mineral spa areas, as well as catchment areas of reservoirs and lakes, should be prohibited. The prohibition could be extended to drinking water extraction areas. Scientific research of the technology should only take place if the fracking liquid used did not endanger the groundwater. The regulations[74] shall be reviewed in 2021. Conventional fracking projects shall generally remain possible.

73. European Commission, „Environmental Aspects on Unconventional Fossil Fuels", http://ec.europa.eu/environment/integration/energy/unconventional_en.htm [18/06/2014].
74. Wirtschaftswoche, „Neues Gesetz: Bundesregierung will Fracking unter Auflagen erlauben", 04/07/2014, http://green.wiwo.de/eckpunkte-fuer-neues-gesetz-bundesregierung-will-fracking-erlauben [07/07/2014].

3.4. Conclusion

Russia plays an important role as a gas supplier for the EU and cannot be replaced in the foreseeable future. A suspension of Russia's supply to the EU is extremely unlikely, as the Russian state budget depends on income from the sale of raw materials.

At the moment a political and economic interdependence exists in the gas business between Russia and the EU, which is also why the supply to Europe was not suspended during the Cold War. Delivery interruptions to the EU due to gas disputes between Russia and Ukraine are also unpleasant for Russia as they can damage its reputation as reliable gas supplier[75]. Thus, the establishment of a strategic gas reserve appears unfounded.

The actual problem in the gas relations between Russia and the EU is the fact that Gazprom owns a monopoly for gas supply in some Eastern European EU members states, in Finland and in the Baltics, and therefore can unilaterally set the price. Consequently, the EU pursues the integration of the European gas market so that gas prices are formed on a pan-European market in the future instead of being bilaterally negotiated between Russia and the individual member states. Central gas procurement through a supranational agency appears unlikely as the Commission strives for a market solution and refuses political price setting, which is precisely what European politicians accuse of Russia. Moreover, central purchasing is opposed by the interests of the member states, such as Germany, who procure Russian gas at very favourable conditions.

Most recently, there have been disputes over the South Stream Pipeline planned by Russia within the scope of establishing an EU domestic market for energy. The EU stopped the project on the grounds that it violated the Third Energy Package of the EU. However, the actual reason for the construction freeze might be the diversification strategy of the EU that is diametrically opposed by the South Stream Pipeline, as it would transport even more gas from Russia to Europe.

The EU's diversification strategy particularly focuses on the Caspian region. Gas shall be transported from the Azerbaijani Shah Deniz gas field to the Turkish-Greek border via the Trans Anatolian Pipeline and then through Albania to Italy via the Trans Adriatic Pipeline. Since Azerbaijan holds 51 percent of TANAP, it controls the network access and thus can prevent non-Azerbaijani gas - e.g. from Turkmenistan or the Eastern Mediterranean from being transported to Europe via the TANAP. From the perspective of the diversification strategy of the EU it could be argued that a realisation of the alternative Nabucco Pipeline could have been more favourable, as 80% of this pipeline would have been run through Turkey and the Balkans and thus would have been in the hands of European energy companies and alternative gas sources could have been fed in.

The role of shale gas will be limited in the EU diversification strategy: This role will balance out the declining conventional extraction of natural gas at best. However, it is still unclear which environmental price will have to be paid in this respect. By contrast, liquefied gas (LNG) has the potential to strengthen the negotiating position of Eastern European states towards Gazprom in order to negotiate price reductions, e.g. by cancelling the linking of the oil price to the gas price. LNG would also be a possibility to balance out supply interruptions in Russian pipelines that could occur from turn-offs of the transit gas intended for Germany through Ukraine. Nevertheless, the procurement of LNG is extremely expensive and requires high investments in infrastructure, particularly in LNG ports.

Should the EU decide to integrate Ukraine and Moldova in terms of energy policy, infrastructure measures for a facilitation of physical "reverse flows" should be adopted. Furthermore, the prohibition of a resale of gas in the Gazprom agreements would have to be renegotiated, which would also require a stronger negotiation mandate of the Commission.

75. European Commission DG for External Relations, "The EU's energy security made urgent by the Crimean crisis", April 2014, http://www.europarl.europa.eu/RegData/etudes/briefing_note/join/2014/522338/EXPO-AFET_SP(2014)522338_EN.pdf [18/08/2014], 36.

The final objective of the EU's efforts in the field of energy policy, particularly with regard to the foreign policy dimension of energy policy, should be the establishment of a European Energy Union. As this would presuppose an amendment of the agreements, the most viable approach appears to be voluntary unions of member states with regard to individual energy policy aspects. By way of example, voluntary unions of member states to aggregate gas demand are possible[76]. The Visegrád Group that has already cooperated on energy issues[77] could play a pioneering role.

76. Jacques Delors, "A Call for a European Energy Community", in: [Sami Andoura, Leigh Hancher, Marc can der Woude], Towards a European Energy Community: A Policy Proposal, (Paris, 2010), VI.
77. Milan Nič, Marek Slobodník, Michal Šimečka, "Slovakia in the EU: An Unexpected Success Story?", in: DGAPanalyse, May 2014, https://dgap.org/de/article/getFullPDF/25429 [18/08/2014].

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