

Energy security as multidimensional concept

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Florian Baumann

Energy Security as multidimensional concept

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Summary

Energy security is more than sustainability, competitiveness and secure supply. It is a multidimensional concept, including external as well as internal action. Economic, political and security measures have to be applied in combination to generate the essential synergies. Thus only an integrated approach, that combines all the different aspects of energy security, can be successful. The EU still suffers a strategic deficit and tries to adjust single setscrews, whilst a wholesale energy security strategy is imperative.

1. The concept of energy security

Energy security usually is defined as “[r]eliable supplies at [a] reasonable price”.¹ Nevertheless, if one takes a closer look at what secure supply constitutes, the complexity of this task becomes obvious. Thus the often-cited triangle – supply security, sustainability and competitiveness – marks the relation between the three main aspects of energy policy, but it is insufficient as a framework for energy security. And moreover, a solely economic understanding of securing the energy supply by means of trade and business is not enough. Growing dependence on foreign supply – as most European countries experience it today – results in uncertainty, if not insecurity. Before political answers can be given to the growing threat of energy insecurity, the concept has to be clarified.

Security aspects of energy

To put it simply, energy security – or in other words stability – is all about security. Any longer interruption of a steady and plenty flow of energy would massively harm a nation’s economic output, political stability and the personal wellbeing of its citizens. Our societies are entirely addicted to energy services, such as gas stations or electricity. Not only private households, but also the business sector and even public authorities and governmental agencies are in the dire need of energy to function properly. Hence a satisfactory supply with energy is a precondition for economic growth and also for the legitimacy within a political entity. But who is in charge of securing our energy demand and why can it be designated as a security issue? While today security has a broader and deeper meaning as it was understood before the end of the Cold War, it is still the primary task of each state or sometimes that of state collectivities (combining national and international security). In an international context “security is about the ability of states and societies to maintain their independent identity and their functional integrity.”² Already in 1952 Arnold Wolfers defined (objective) security quite universal as the “absence of threats to acquired values”.³ Thus in accordance to Wolfers’ definition, security is more than just defense policy and physical survival; it also implies “a substantial range of concerns about the conditions of existence.”⁴ Economic welfare and individual safety and the stability of a political system can be seen as core values of every society, thus energy insecurity comprises a major threat – or better risk⁵ – to those values. The riots during the major blackout 1977 in New York City, cutting off millions of people from electricity for 15 hours, are an example what even a short energy interruption could provoke. So this article will concentrate on the security aspects of energy security in different policy areas.

Dimensions of energy security

Defining energy security not from the normative end – sufficient and affordable supply – but from the input side where private or political actors can add to a higher level of safety, four different but at the same time overlapping dimensions can be identified:

1. Internal policy dimension
2. Economic dimension
3. Geopolitical dimension
4. Security policy dimension

On a superordinated level these dimensions all together have to do with security as energy security already was designated as a prerequisite for economic processes as well as political stability and legitimacy. Although energy affects almost every aspect of our lives, the above listed are the key dimensions for stabilizing and safeguarding the supply of energy. Even though this paper separates them for the analysis in reality they are interdependent. For example: Functioning international energy markets and domestic supply chains are vital prerequisites for energy security, but without stability and security in the producing countries they become useless.

The following pages will sketch out who might fulfill these tasks and by what means a higher level of energy security could be reached. One should keep in mind that absolute security is never within reach, but if the right policies are enacted a priori, the looming impacts of an energy crisis could be attenuated. One thing that can already be said at this point is that due to increasing independencies, no nation-state alone will be autonomous enough to fulfill these duties alone. Thus a precondition for energy security is global or at least regional cooperation. From a European perspective the European Union (EU) might be the most promising actor if Brussels acts in a subsidiary symbiosis with its member states.

1.1. The internal policy dimension

The 2005 World Energy Outlook estimated a cumulative global infrastructure investment of \$17 trillion until 2030, whereof the OECD-countries will have to contribute about 40%.⁶ The total amount of predicted investments even rose in the subsequent report.⁷ So the internal dimension first of all calls for extensive financial acquisitions for maintenance and extension of energy networks. Especially the growing demand of electricity requires massive investment in new grids and power plants. Some major blackouts resulting from technical failure or accident – as the one in November 2006 that stretched almost completely over Europe – can be taken for instance that parts of our infrastructure are subject to failure. Furthermore, investment in short time spare capacities for oil production to even out sudden interruptions – e.g. in case of regional conflicts – and demand fluctuation is urgently needed. As will be shown in chapter 4, the security of transnational energy networks also asks for joint action, but primarily each state has to assure ample domestic capacities in production, storage and reserves. Building terminals and storage facilities for liquefied natural gas (LNG) as well as investment in modernizing mature plants and grids could be a first move on that direction. In addition to domestic infrastructure policy, the EU can support its member states in form of general directives or best-practice guidelines and by solidarity action – e.g. access to strategic reserves – in case of national shortfalls.

Infrastructure investments

Besides investment and maintenance of infrastructure, emergency reaction should not be forgotten. Every supply interruption challenges the service providers as well as local and national authorities. The existing strategic oil reserves – which are obligatory in every OECD member state – can stand-in some time. But neither natural gas nor electricity is or respectively can be storied in big quantities or over long periods of time. Thus every intrusion of supply, whether by accident or due to fuel shortage, would affect industrial production, public services and all the other societal activities.

Emergency Planning

The above mentioned events in New York or the breakdown of oil production in the Mexican Gulf after Katrina are just two of many examples of our dependency on stable energy services. Thus civilian emergency planning to guarantee essential services – such as health care, legal order or nutrition – in case of a crisis is urgently needed. Preparedness is thus a major task in dealing with the energy topic. Even though this lies within the core domain of each nation state, regional or international collaboration could lead to synergies. The EU's claim for energy solidarity or the cooperation-mechanism of the International Energy Agency have to be further evolved and strengthened to deal with the growing risks of failure or attacks on infrastructures.

Energy efficiency Another area for improving internal energy security lies in increasing energy efficiency or productivity. Efficiency for end-users is to be understood as same outcome with a lower input of energy, which means saving energy and lowering costs.⁸ In the industrial sector, rising efficiency stands for the lesser use of energy per unit produced and thus decoupling energy-input and economic growth. At the spring summit of European heads of government 2007 the EU agreed on the common goal to increase energy efficiency to reduce energy-usage at 20% until 2020.⁹ And the U.S. Department of Energy Strategic Plan states: "By reducing the energy intensity of America's economy, energy efficiency advances provide one of the best means for reducing the Nation's dependence on foreign fuel supplies and improving the quality of the environment, both in the near and long term."¹⁰ To do so, the EU's plan "Towards a European Strategic Energy Technology", focusing on efficiency, diversification, decarbonisation and trans-European interconnection, sketches out possible progress to a safer energy future.¹¹ Also, joint US-EU research programs on energy technology – for e.g. more efficient engines, industrial machinery, power generation and power-saving end-user products – are quite promising in order to reach those ambitious goals.

Fuel mix Apart from needs for infrastructure, consuming states also ought to rethink their specific fuel mixes. Again electricity is the key factor at this point. Alternative sources of energy – such as renewables and nuclear – can decrease import dependence and contribute to supply security as long as they are based on indigenous resources. In particular wind energy and photovoltaics can be at least used for complementary electricity production.¹² Hitherto the use of 'green' energy for heating and cooling or in transportation is still underdeveloped. In the US 96% of the energy used for heating comes from conventional sources, such as natural gas, electricity and distilled oil.¹³ And within the EU renewables only account for less than 10% in heating and cooling private households.¹⁴ Geothermal or solar energy respectively could increase the level of autonomy and save fossil fuels for e.g. building strategic national reserves. While the composition of specific fuel mixes will remain a national domain, the European Commission could recommend margins for diversification and provide information about each member state's fuel usage to gain transparency and eventually a more coherent energy policy.

1.2. Economic dimension

Energy markets Firstly, the quality of (national) energy policy could be evaluated in terms of meeting domestic demand. As mentioned in the beginning, a sufficient and affordable supply is the main precondition for energy security. This means state – or supranational – actors have to set the rules for functioning markets, thus end- and industrial-users can acquire the amount of energy they request at prices that are reasonable. Energy, namely in form of electrical power, is not only a vital economic input-factor but also dominates our ever-day life. One only has to think about how one's daily schedule

would be affected in case of an energy shortage. Distributed production – regional or even local – eliminates transport risks that correlate with distance, puts pressure on energy prices and adds to security by broadening output facilities. So lawmakers have to create a framework for multiple providers of energy services. A negative example in this case is Germany, where only four major companies dominate the electricity market. Liberalized markets with a variety of competitors may also benefit from innovations in efficiency and the use of alternative fuels. The EU's ambitions to liberalize the markets for electricity and natural gas have already succeeded in this and should now be expanded to the Union's neighborhood. Thus, transparency and stability could be exported to the near abroad and could lead to an energy security repercussion in the EU.

In addition to the scarcity of fossil fuels, their global distribution especially in the so-called strategic ellipse is a major factor of insecurity. While crude oil is preponderantly transported over sea lanes, most of the natural gas is pipeline-bound. Thus an ambivalent interdependence evolves that binds consumers and producers together on a long-term base. The effects are durable relations between exporters and importers but on the other hand a high addiction to one geographical source of supply. So energy-related business should be based on a double strategy: long-term contracts and diversification. Contracts are the legal foundation of uninterrupted supply, while diversification opens new transit-routes and origins of resources. Accordingly, not only accidental shortages but also the impact of intended disruptions could be mitigated. The main contribution of business to security and diversity is to be seen in upstream- and transport-investment in producing countries. Net-importers can improve their situation substantially if national companies are involved in resource exploration and extraction abroad. States could stimulate such foreign investment by granting security loans or other incentives for fully integrated corporations. Working together, the EU, its member states and other major actors should promote the global implementation of the rule of law in energy related trade, potentially under the umbrella of the World Trade Organization.

International trade

Another field for economic action – if required with state support – can be identified in the struggle for technological leadership. Groundbreaking inventions in fuel efficiency, the use of alternative sources of energy or related technologies directly add to energy security by reducing costs – which brings forth money for new investment and private spending –, the possibility of fuel diversification and by lowering consumption. Next to these effects, technological leadership generates jobs, stimulates economic growth and thus legitimizes existing political systems and furthermore reduces environmental degradation. The European Commission therefore calls upon the EU member states for joint engagement: “The energy technology innovation process demonstrates structural weaknesses that can only be overcome by concerted action, simultaneously on many different fronts ... Working together will benefit all, exploiting the federating role that the European Union can play in the field of energy.”¹⁵ Whilst the European states on their own are too weak – or in the terms of an economy of scale: too small – to compete on a global level, the Union as a whole has a fair chance to gain leadership in energy technologies.

Technological leadership

1.3. Geopolitical dimension

As energy resources usually are transported over long distances crossing various national territories, concerted action is the only way to secure worldwide trade in energy goods. But as long as global energy services are not included into the umbrella

Transnational networks

of the World Trade Organization, alternative forms to formulate common rules have to be elaborated. On a regional base, the EU-initiatives on single markets for electricity and natural gas are an outstanding example. In contradiction to the common market regulations there are still some national obstacles that obstruct intra-European energy trade.¹⁶ Anyhow, the free flow of energy resources and services is an adequate means to avoid short-term supply interruptions and to encourage quality of services as well as technological innovations within the EU. Again the EU is too small and holds not enough domestic resources to be a sufficient energy market on its own. Thus liberalization of those markets should be promoted on a larger scale and have to be codified under the formal rules of international law.

Energy Charta Treaty

On a wider geographical scope as the EU internal market, the 1994 *Energy Charta Treaty* (ECT)¹⁷ and its follow-up agreements tried to enact a global legal framework for transnational energy services. The ECT includes:

- most-favored treatment for foreign investments,
- non-discriminatory trade in materials, products and equipment,
- regulations for dispute settlement, and
- the promotion of energy efficiency.

From a European perspective the main shortcoming of the ECT lies in the puny participation: The Russian Federation signed the treaty, but never ratified it. The USA, Saudi Arabia, Iran and other states like Algeria are only observers and do not aim at full membership. Enlarging the ECT-regime geographically and a functional enhancement would contribute to energy security, particularly in form of transparency and liability by enhancing the scale of this institutionalized energy market order.

Re-Nationalization

Recently a trend towards re-nationalization of resource deposits, infrastructures and energy corporations can be observed. One of his first actions as the newly elected Bolivian president, Evo Morales, was to place the energy sector under state control, not long after the battle between Yukos and the Kremlin took place in Russia.¹⁸ The nationalization of the energy business hinders the workings of economic rules and enables that political motives become predominant, which causes at least one negative effect: state-owned companies do not always respect market rules and may instead be involved in domestic or even international politics. Using resources as political leverage is nothing new. As early as 1957 Abdullah Tariki – then head of Saudi Arabia's Directorate of Oil and Mining Affairs – stated that oil was „the strongest of weapons that the Arabs wield.“¹⁹ Today growing import addiction, a rising number of net-consuming states and the inevitable depletion of fossil fuels in the years to come are framing *a new great game of Realpolitik*.

Not only the possibility to use oil and gas as a political “trump card”²⁰ but the very fact that private consumers – or to state it more clearly private companies – have to deal with e.g. National Oil Companies (NOCs), unveils an asymmetric relation. While in economics normally cash-flow and supply-demand equilibriums are the key determinants, NOCs and other state-owned companies sometimes are part of the toolbox in international power politics. In combination with what Thomas Friedman called “The First Law of Petropolitics”²¹ conflicts between “petrolist states” and consuming states may increase. With new players on the playing field Western democracies will have to balance between supply security and their efforts on the promotion of democracy. One can take the Chinese role in the Nigerian oil business and Beijing's reluctance to accept a UN resolution against the regime in Khartoum as an example for the future of international energy politics.²² Close cooperation

between business actors, national governments and EU representatives could maintain the equilibrium between nationalized upstream and private downstream. Especially the relations to resource-rich and aggressive states like e.g. Iran include an economic security dimension and cannot be handled without support from governmental institutions. And even single-handed action of European states will not be successful without backing from Brussels. Due to the threatening addiction of e.g. the Baltic EU-member states or Poland on Russian oil and natural gas supply²³ a coherent approach of the Union towards Moscow is urgently needed.

When reviewing older publications on energy politics²⁴ first of all the growing import dependency is mentioned, and later on shortages due to the scarcity of fossil fuels is an important topic. Only recently have new threats been recognized more prominently, while the older ones still prevail. International or transnational terrorism, piracy and political instability are among the main considerations related to energy security nowadays. So the geopolitical dimension of energy security requires strategic concepts and holistic means, especially in dealing with fragile states. The various initiatives of the OECD and NATO and above all the EU's European Neighborhood Policy (ENP) already take great efforts to stabilize pivot states in their geographical periphery. Democratization and development policy can, by empowering state authorities, encourage good governance and thus strengthen energy security. On a larger scale, Javier Solana calls for a coherent, strategic and interest-based "external relations policy on energy ... fully recognising the geo-political dimensions of energy-related security issues".²⁵ Therefore, the EU should develop an integrated foreign energy policy concept, through cross-pillarization of its external instruments such as ENP, CFSP (*Common Foreign and Security Policy*) and the Commission's external relations.

Soft Power

1.4. Security policy dimension

The dominant threats, mentioned in the chapter above, cannot be tackled by soft power alone. Terrorist attacks on infrastructures or piracy whereof both are not executed by state actors, need to be addressed with conventional security policy. Last year terrorists launched 331 attacks on utilities, such as oil refineries, tankers or electrical transformers.²⁶ And piracy is not any longer uncommon in some waters at the African east coast, next to the Indian subcontinent or Southeast Asia.²⁷ As Europe – and the USA as well – depend on the continuous flow of oil and gas to fuel their economies for transportation and everyday-life, they cannot ignore the rising imminent threats on their supply. One possible asset in this context is the close cooperation with vulnerable states, including information sharing, training and debates on best practices. The paradox contained by that situation is the some of the most threatened states possess the lowest capacities according to risk assessment, crisis reaction and well-trained military or police forces. For the good of their own energy security as well as to support those states, the industrialized consuming nations should expand their engagement within that field. Besides giving technical and operational assistance to the regions in danger, NATO, the EU and other security regimes should think about they themselves will have to react in case of an emergency.

Lately *Energy Infrastructure Dimension* (EIS) was introduced as a fixed term to the debate.²⁸ Although some might instantly think of resource wars, classical security policy and even military capabilities can play an important role in safeguarding energy supplies. As a follow-up effect of the growing import addiction more energy resources have to be transported over even longer distances, which make a supply security strategy indispensable. Although the EU does mention the use of CFSP/ESDP

Energy Infrastructure Security

(*European Security and Defense Policy*)-instruments, Brussels does not clarify how those might be used.²⁹ On the other hand, NATO already has found niches, where it can contribute to energy security: “We support a coordinated, international effort to assess risks to energy infrastructures and to promote energy infrastructure security.”³⁰ Thus EIS refers to threat analysis and immediate action in case of an emergency. “Securing pipelines and chokepoints will require augmented monitoring as well as the development of multilateral rapid-response capabilities.”³¹

Hard Power Without calling it EIS directly, Javier Solana lately introduced a quite similar approach: “In the area of crisis response ... we should do more to get shared assessments of the risks and vulnerabilities we have. Related to this is the question of physical protection – refineries, terminals, pipelines etc. This is an obvious concern to all – because of terrorism, spill-over of regional conflicts etc. The private sector clearly has a role to play. But I believe this is an area where we should do more together in the European Union and with third countries.”³² Assessing risks include regional consultations, military analyses and intelligence reports but when a crisis occurs armed forces may be essential for physical protection of infrastructure, to settle conflicts and to secure transit routes. Armed conflicts or even wars about the access to resources are not that unrealistic.³³ Again, with tighter markets and rising demand the availability of sufficient resources – and especially energy – is a vital interest of every state, and will foster tensions between the “haves” and the “have-nots”. Another interesting question is how to deal with resource deposits in fragile states, when sovereignty is not longer existent? At which point of state failure are stabilizing efforts or even a military intervention legitimate? The use of force as suggested here does not contain the illegal annexation of foreign resource deposits, as Henry Kissinger recommended in his “strangulation”-speech.³⁴ Rather the 1987/1988 operation “Earnest Will” carried out to shield Kuwaiti oil tankers during the Iran-Iraq war could be an example.³⁵ Hard power should not be understood as the only means of enforcing energy security, on the contrary, it must be seen as a strictly complementary asset. NATO already is involved in maritime security with its naval patrols, e.g. under the “Active Endeavour” – mission in the Mediterranean Sea.³⁶ The European Union due to its commitment to the *Petersberg tasks* – the full spectrum of crisis management – should engage more within this last dimension of energy security.³⁷

2. Energy Policy for Europe

Main challenges Due to the magnitude of the problem and the above-mentioned shortcomings of the nation state when on its own, at least some involvement of the institutions in Brussels is a precondition for an effective approach. The EU is the world largest importer of oil and natural gas and therefore must have a special interest in energy security. Hence last year the Council of the European Union launched the “*Energy Policy for Europe*”-initiative³⁸ and announced an “effective Community policy, coherence between Member States and consistency between actions in different policy areas.”³⁹ On supply security, the Council identified three main challenges:

- A common external policy approach,
- diversification of fuel origin, transit routes and resources, and
- common crisis management, based on solidarity and subsidiarity.

But while during the German EU-presidency plenty of means against global climate change were initiated, the external dimension of energy security still does not go beyond the instrument of various dialogues. Climate change and energy efficiency are vital but not sufficient elements of an integrated energy policy. The EU did right

to name *sustainability*, *competitiveness* and *security of supply* as key elements of the Energy Policy for Europe.⁴⁰ But concentrating on ecology and technology alone will not be enough to secure the Union's future energy demand. Whilst the single markets for electricity and natural gas in combination with the new efforts on reducing carbon dioxin, promoting energy efficiency and alternative sources of energy are serious first steps, the external dimension – especially its hard power component – is still underdeveloped. In their joint proposal the High Representative Javier Solana together with the European Commission name "... [e]nhancing physical ... security as well as the energy infrastructure safety" among the guiding principles of the external security of energy supplies.⁴¹

To progress this component, especially in the field of energy security the EU has to formulate a stringent strategy, showing ways and aims of its external energy policy. In its 2003 European Security Strategy (ESS) the EU mentions, "Energy dependence ... [as] a special concern for Europe" but does not develop any further congruent approach on that topic.⁴² Instead of all the Green Papers and action plans the EU needs a single document, a stringent framework for the EU's future energy policy including the external dimension, in particular all aspects of security. As the global competition for resources – and especially energy resources – evolves into the realm of geopolitics, the European strategic deficit results in intolerable vulnerability. A closer cooperation between EU and NATO together with a realistic and interest oriented revival of the transatlantic partnership can help the Europeans to overcome this strategic deficit.

Strategic deficit

3. Guidelines for the EU

In a nutshell, energy security cannot be reduced to economic means, and security in this field of action does not stand for crude militarization. While the United States and others accepted this complexity for quite some time, Europe still lacks that kind of strategic thinking and appeal to the force of markets and energy dialogues. Tightened competition for energy, the growing instability in some of the producing countries and thus a new power game requires a political adjustment. As the latest Venusberg report states: "Europeans must, therefore, balance their rightly value-based approach to international relations with hard political realism if they are to compete effectively."⁴³ For that reason the EU has to locate the main risks to European energy supplies, formulate its political and security interests and subsume them into a pragmatic strategic concept.

Integrated Concept

Since none of the above-mentioned dimensions alone will be sufficient to provide energy security, each of them has to be incorporated in a comprehensive political agenda. Certainly, while economic, technological and political means are to be preferred, military and civil-military crisis management form a vital cornerstone of a full-fledged energy policy. The keyword at this point should be *complementarity*. It is not "either or", rather the challenge is to use the right instrument at the right time. The economic as well as the internal dimensions are somewhat predominant, while the importance of political aspects – complementary to the renaissance of NOCs – will grow. But security and military means in terms of monitoring, risk assessment and training of local forces should be considered on a permanent basis, whereas military intervention in form of peace enforcement and post-crisis management are more ultima ratio than everyday business.

Multidimensionality

Next to the multidimensionality of means, energy security asks for a multilateral approach.⁴⁴ Therefore, institutions like the International Energy Forum or the

Multilateral approach

International Energy Agency can provide a basic common understanding, while other organizations or regimes such as the NATO or the ECT have to take care of supplementary aspects. As there is no global framework to deal with all aspects of energy security, a variety of regional, bi- and multilateral organizations should engage in providing supply security. From a European perspective the EU should be a dominant actor in this field, as it is the only organization that covers – at least theoretically – all aspects of the introduced concept. To do so, the Union has to overcome its strategic deficit and clarify what role it wants to play. Anyway, multilateral cooperation at least between Europe, the OPEC-States, Russia, the USA and the developing giants China and India is essential to tackle the problems of energy security in an adequate way.

4. Conclusion

New security thinking

Obviously there is more than one path to energy security, however, unilateralism and reductionism will not be successful. Already proposed technical and economic efforts in the field of energy policy are important first steps, nevertheless a more holistic approach is needed. Especially internationally coordinated, multilateral security measures have to be further elaborated. The basic security aspects of energy security are still somewhat unattended, particularly in public opinion. However, a sustainable concept of energy security must bring together all above-mentioned dimensions, ranging from mere economic and political facets to the full spectrum of soft as well as hard security. Tightening energy markets and increasing threats to energy infrastructure ask for a new thinking of how to safeguard energy supplies. The use of security instruments should not be seen as an *ultima ratio option* in form of a militarization of energy policies, rather it should be seen as a *complementary answer to supply risks* that cannot be addressed by other means alone.

Thus states should begin to understand the complexity of energy security and respect energy as a vital interest. Instead of dealing with it in either economic, political or security means they should see security as an umbrella of energy policy. To protect our acquired values – as cited in the introduction – economic development, individual safety and political stability a stable and sufficient supply of energy is needed and therefore a precondition for security. Without energy or secondary energy services our lives would be different and not for the better. So energy policy should be securitized⁴⁵ and thus has to be handled as a security matter: “The days of easy energy are over...”⁴⁶.

Notes

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