1. Introduction

Few countries in the world can boast of being independent of energy supplies from abroad. Even by the crudest measure of energy dependence – net energy imports as a share of total domestic energy consumption – all of the EU’s 28 member states depend greatly on other countries for their energy supply, none of them having a positive energy trade balance. The EU as a whole imports 54% of its energy needs (with intra-EU energy flows being treated as “domestic”) (Eurostat, 2017). The most advanced East Asian nations – Japan, South Korea, Taiwan and Singapore – face an even more precarious situation, being almost totally dependent on imports for meeting their energy needs (see e.g. World Bank, 2018). Other countries are richly endowed in terms of domestic fuel resources. Even so, many of them – including the world’s two most populous nations, China and India – import far more fuel than they export.

Finer measures reveal a more complex – and, from the perspective of importers, more troublesome – overall picture. Most obviously, countries that are net energy exporters on the aggregate level are usually net importers of one or the other of the individual fuels they need. By the 1970s, for example, the Netherlands had, thanks to vast discoveries of domestic natural gas, become a net energy exporter, but the country remained critically dependent on imports for a range of other fuels, including crude oil – in a way that made it highly vulnerable to the turmoil of 1973/74 and 1979 (Hølsgen, this issue). Moreover, if we move away from regarding energy sources as distinct commodities and, instead, adopt a systems (or value-chain) perspective, it becomes clear that many countries are dependent on foreign nations not only for the supply of various fuels, but also for a variety of technologies, processes and services relating to different parts of the energy system. In nuclear energy, for instance, energy dependence cannot be properly grasped by solely looking at uranium imports, since dependence management here has much more to do with securing agreements with foreign countries for conversion, enrichment, and spent fuel services. Similarly, in oil and gas, access to technology and equipment is key to the system as a whole, a fact that has made even powerful fuel exporters – such as Russia and Saudi Arabia – critically dependent on other countries in seeking to meet domestic demand and enable exports (e.g. Gustafson, 2012).

Furthermore, dependencies are often more complex than they appear at a first glance. A common argument in the debate about oil import vulnerability, for example, is that a potential disruption in supply from one source may easily be compensated for by bringing in supplies from elsewhere. In reality refineries are often locked into one particular type of crude oil, so that it often becomes much more difficult – and costly – than envisaged to actually switch to a totally new source of supply (Reuters, 2014a).

Clearly, then, import dependence is a phenomenon that involves much more than what can be conveyed through simple statistical indicators and regression analyses. In this article – and in the special issue that it serves to introduce – we argue that quantitative analyses need to be complemented by in-depth qualitative analyses of nations’ energy dependence. And one of the best ways to grasp the qualitative dynamics of energy dependence, we contend, is to study long-term patterns of change over time. In other words, an historical perspective can substantially enrich our knowledge about energy dependence.

Earlier research on the nature of energy dependence and how actors have coped with it has been surprisingly sparse, especially when it comes to research that takes into account long-term developments over time. Moreover, the literature has been strongly biased towards a focus on the large and most powerful countries of the world (e.g. Yergin, 1991, 2011; Moran and Russell, 2009; Duffield 2015), or, alternatively,
larger blocs of countries, notably the EU (Correljé and der Linde, 2006; Umbach 2010). The notion of “energy geopolitics” has been almost totally reserved for the machinations of these (blocks of) countries in the international arena (Klare, 2009; Marketos, 2009; see also the recent special issue on energy geopolitics in the Economist, 17 March 2018). There has been far less research on how smaller and less powerful nations have tried to handle their energy dependence, and how the interaction between larger and smaller nations has affected global dependency patterns. This special issue aims to fill this gap. Adopting an historical and largely qualitative approach, we set out to study how actors in a number of small and/or less powerful European nations have tried to secure their energy needs in the international context, and how they have coped – or tried to cope – with their energy import dependence. In this way we hope to contribute to an understanding of the geopolitics of energy of smaller nations.1

This introductory article is structured as follows: First, we discuss the nature of energy systems in an international energy supply context and how smaller nations differ from the larger ones from a systems point of view. Second, we discuss how smaller nations have – and how they have not – tried to reduce their foreign energy dependencies by developing domestic energy sources. Third, we analyse a variety of methods that small nations have adopted to cope with – rather than reduce – their energy dependence. The last section, finally, concludes the analysis by discussing the main differences between small and large nations in the geopolitics of energy.

2. Smaller nations’ energy dependence: a systems perspective

A systems perspective, we argue, is absolutely necessary if we are to properly understand, let alone be able to cope with, energy dependence. This is especially so when we analyse the world’s smaller and less powerful nations. Energy systems comprise multiple activities, ranging from prospecting and exploration to fuel extraction, conversion, refining, transport, storage, use and waste management. The general transport network of rails, roads and seaways are used for parts of the transports, but dedicated networks distributing electricity, gas or hot water are increasingly used for the final transport to end users. Most energy systems are transnational in character with many activities along the supply chain outside the country where the energy is used, thus generating dependencies on foreign nations.

For example, not all countries – especially not the smaller ones – can afford to operate their own tanker fleet. Instead, they often depend on other countries for overseas fuel transports – whether we talk about oil, gas, coal, uranium or biofuels. And, clearly, small nations cannot afford to have their navies escort their fuel shipments. Similarly, in terms of conversion and refining dependencies, while most of the smaller countries took measures early on to construct oil refineries at home, rather than relying on refining of oil in foreign locations (see further the country case studies in this special issue), they rarely operate their own nuclear enrichment facilities. Some also depend on other countries for the management of their spent nuclear fuel. Eastern Europe’s long tradition of returning all its spent fuel to the Soviet Union is a case in point (Tchalakov and Mitev, this issue).

Storage is another key component that, in the case of smaller nations, is often internationalized. Luxembourg, the most extreme case here, keeps 89% of its oil stocks abroad (as of 2017). Estonia, Ireland, Belgium and New Zealand also keep around one-third of their oil stocks in foreign locations (IEA, 2017). This may seem paradoxical, since storage facilities are often thought of precisely as tools for coping with international dependencies in energy (see further below). Yet the high costs of keeping oil and other fuels in storage have motivated small countries to cooperate, both with each other and with larger nations, for example under the auspices of the International Energy Agency, IEA.

Small countries have also had fewer opportunities to put pressure on foreign energy suppliers in times of crises. When Austria, back in 1968, embarked on imports of Soviet natural gas, the national oil and gas company OMV soon found that the Russians were not able to live up to their contractual obligations; yet the Austrians felt there was little they could do but simply accept the situation (Högselius, 2013). In a similar vein, Denmark’s coal imports from Poland in the years around 1950s were fraught with problems as the Poles proved unable to deliver the contracted volumes (Rüdiger, this issue). In cases like this, larger nations appear to have been more successful in putting pressure on the suppliers; they have found it easier to exploit the far-reaching dependence of exporting nations on large foreign markets.

Compared to the larger countries, the world’s smaller nations are as a rule also more dependent on foreign suppliers of key energy technology used domestically, from nuclear reactors and oil drilling equipment to LNG plants and high-voltage transmission lines. Bulgaria’s heavy dependence on Soviet nuclear technology is a case in point, whereas Greece, Denmark and Sweden – as elaborated on in further detail in this special issue – found that they had to rely on American and other foreign technology when constructing domestic oil refineries. In the same vein, when the Nordic countries set in motion ambitious domestic oil exploration projects in the 1960s, they had little choice but to seek cooperation with the large international oil majors, becoming dependent on them for access to key equipment and know-how (Rüdiger, this issue). Spain, meanwhile, drew on German and later on American technology when developing facilities for synthetic fuel production (on the basis of bituminous shale) (Camprubi, this issue).

All in all, while large countries have often sought control over all components in the system (or the entire value chain), smaller countries have had fewer possibilities to do so. Their opportunities to influence the extraction, transportation and processing of imported fuel resources have been limited, and in addition they have often been dependent on foreign technologies in constructing their domestic energy systems.

There are some interesting exceptions, however, from this general pattern. In the case of storage, the logic that we see in oil does not necessarily hold for other energy sources. Gas storage facilities, for example, cannot be economically built everywhere, necessitating transnational cooperation and agreements. In this context, several smaller nations have been able to capitalize on attractive local geologies to build up important international positions. Latvia is an interesting case: it sits on one of the largest gas storage facilities of the former Soviet Union. The facility was constructed to counter supply problems, especially in winter, throughout the Baltic region and also in St. Petersburg. After the collapse of the Soviet Union, it has continued to play an important role far beyond Latvia itself, being of great significance for Estonia, Lithuania and even Russia (Reuters, 2014b). Likewise, large-scale electricity storage has to a great extent relied on hydropower dams, a circumstance that has helped Norway, through construction of a number of submarine cables to continental Europe, to develop a position for itself as the “battery of Europe” (Thue, 2013).

Transportation is another key activity in international energy where several smaller nations have played important roles. Both Norway and the Netherlands, for example, have played important roles in global oil transports. Historically, the Netherlands and Spain also managed to use the remnants of their colonial empires for building oil refineries in logisticlly attractive locations such as the Dutch Antilles, the Canary Islands, and the African shores of the Gibraltar Strait (Holsgens, this issue; Camprubi, this issue). Rotterdam and Antwerp emerged as the most important European oil ports, in a way that, from the perspective of Dutch and Belgian state and business actors, was seen to compensate for their far-reaching oil import dependence. On the other hand, Rotterdam’s critical importance for European oil imports was a primary motive for the Arab nations to single out the Netherlands as a main

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1 We realize, of course, that the notion of “small nations” is somewhat ambiguous and can be defined in different ways. The six countries we have chosen vary in size, but none of them has been a major player in twentieth- and twenty-first-century geopolitics of energy.
target in the 1973 oil embargo (Hölsgens, this issue).

As far as inland energy transmission is concerned, many smaller nations have managed to exploit their geographical location by placing themselves in “hub” positions in cross-border flows of fuel. Switzerland early on established itself as a key hub in the European electricity system, taking on a role as interconnector between the German and Italian national grids – in a way that was widely regarded as beneficial for the Swiss (Lagendijk, 2008). From the 1960s the country became a key transit country for oil and gas pipelines as well, while also emerging as the world’s most important financial hub in oil (Haller, 2016). While the Swiss remained almost totally dependent on other countries for its oil and gas supply, the hub role was widely perceived as an effective way to reduce the country’s vulnerability to international supply crises. When the Soviet Union in the late 1960s and early 1970s concluded major gas export deals with West Germany, Italy and France, similar hub positions were successfully attained by Austria and Czechoslovakia. For both, being located on the export route between the Soviet Union and the larger Western European nations was seen to reduce their vulnerability – even though in a statistical sense, they remained greatly dependent on imported natural gas (Hölsgelius, 2013). Today, Russia’s enthusiasm for gas pipelines under the Baltic and Black Seas is a most prominent example of how large nations may be greatly troubled by the key hub roles played by smaller countries and how this may result in a perceived need to free themselves from transit dependencies on smaller – and “problematic” – nations, in this case mainly Ukraine. But small nations also see opportunities in the larger nations’ efforts to restructure their energy exports and imports. This is the case, for example, in Azerbaijan, Georgia, Greece and several nations in south-eastern Europe, who have become (or hope to become) transit countries for oil and gas on its way from Central Asia to Western Europe (Cornell et al., 2006; Arapostathis and Fotopoulos, this issue).

Finally, there are a number of encouraging cases of smaller nations that actually managed to avoid the problem of technological dependencies on foreign countries. The most striking example is perhaps Sweden’s domestic design of nuclear power plants, which in the 1960s became a source of much technological pride (Fjæstad and Jønter, 2010). Both Sweden and Switzerland, their smallness notwithstanding, also became world leaders in high-voltage transmission technology and turbines for hydroelectric power plants (Fridlund, 1999). In communist East-Central Europe, Czechoslovakia retained a dominant technological position in key segments of the equipment industry, not least in the nuclear field. More recently, Denmark’s and Spain’s rise to dominance in wind turbine production exemplifies how smaller countries may play important technological roles in the twenty-first century (Camprubi, this issue). From an energy dependence perspective, however, more important is perhaps the fact that many smaller countries, having been initially dependent on foreign technology for various domestic energy projects, soon learnt to build on the imported technology to develop their own solutions. All in all, while the main rule is clearly that smaller nations are weaker in the international energy world, there is nothing automatic in this.

3. Reducing energy dependence through development of domestic energy sources

Energy import-dependent countries have historically pursued two broad strategies for coping with energy dependence and the vulnerabilities it generates. The first and most obvious has been to develop domestic energy sources. The second has been to find ways to manage – rather than to reduce – energy imports. In this section we elaborate on the opportunities and problems that small countries have historically experienced when it comes to the first strategy. In the following section we then turn to the second strategy.

Historically, efforts to reduce energy dependence through development of domestic energy sources can be traced back to the second half of the nineteenth century, when a rapid increase in energy demand in combination with radically new opportunities for transporting bulk commodities paved the way for large-scale dependencies on imported coal in many smaller countries, especially in Europe. As industries and governments became aware that coal imports generated dependencies on other nations – especially on Britain, whose “coal famine” of 1872–73 generated one of the first alarms in many countries that imported British coal (see e.g. Hölsgens, this issue) – the “natural” response, in the eyes of many actors and analysts, was to look for possible domestic alternatives. By the end of the nineteenth century national geological surveys had been set up in most European countries (Avango et al., 2018). Together with private explorative initiatives, these institutions became tools in the quest for greater autonomy. Identifying domestic coal deposits was perceived as the most important task here, but alternative fuels also received attention. High hopes were placed, for example, in the role of domestic peat resources for energy independence, as is clear from the energy histories of countries like Sweden (Kajiser and Högseiulius, this issue) and, later on, emerging nations such as Latvia and Lithuania (Kreitin, 2013).

The quest for domestic substitution of imported coal gained momentum in earnest following the trauma of coal shortages during the First World War. The disruption of coal imports from Britain led to shutdowns of gas lighting in cities such as Lisbon and Milan (Cordova, 2008; Del Curto and Landi, 2008) and in many places railway transport and industrial activities threatened to come to a standstill. As a consequence exploration for domestic coal deposits came out high on the agenda for Interwar governments. A consensus was established that the state must assume a central and active role in energy issues. This consensus was further strengthened after the Second World War, by which time not only coal, but also oil dependencies had come to the fore. Seeking to promote domestic energy sources, countries eagerly set out to develop domestic fossil fuels or hydroelectricity. The degree of success in this varied greatly. In the immediate aftermath of World War II, Austria assumed a leading role for some time in the European petroleum industry, although its production soon peaked and then quickly declined; a similar development followed in the case of natural gas (Rambousek, 1977). Romania, for its part, managed to retain its role as an important oil and gas producer, in a way that later on was to shape Romania’s relative independence vis-à-vis the Soviet Union (Murgescu, 2006). Estonia, starting in the Interwar era, set out to exploit its massive domestic oil-shale riches, at a rate that was radically scaled up following the 1944 Soviet annexation (Holmberg, 2008). The Soviet Union also stimulated local peat extraction in the Baltics, in Belarus and elsewhere. In East Germany, Czechoslovakia, Bulgaria, Yugoslavia, Albania and Greece, domestic lignite resources started to be aggressively exploited during the postwar decades, the poor quality of this fossil resource notwithstanding (Tchakalov and Mitve, this issue; Arapostathis and Fotopolous, this issue; Hölsgelius, 2015a). Francoist Spain, facing international isolation, also took on the challenge of identifying new coal deposits and exploiting them, in spite of the coal’s poor quality (Camprubi, this issue).

Some countries were extremely lucky. The Netherlands, for example, in 1959 found one of the world’s largest natural gas fields on its territory (Kajiser, 1999; Hölsgens, this issue). At the same time explorations for oil and gas began in the North Sea, following a 1958 agreement on how to divide the continental shelf among the North Sea countries. Ten years later the first major discoveries of oil and gas were made in the Norwegian sector, soon followed by discoveries in the British, Danish and Dutch parts of the shelf (Högseiulius et al., 2016). Norway soon emerged as one of the world’s most important oil-producing nations. Other countries tried but failed to find significant fossil fuel deposits. Sweden and Finland belonged to the unluckiest here: neither coal, nor oil, nor gas was found (Kajiser and Högseiulius, this issue; Myllntaus, 1991). Switzerland also failed to find oil on its territory, despite heavy investments in oil prospecting (Haller and Gisler, 2014). However, all three nations attained a remarkable success in developing hydroelectricity – the “white coal”. Other smaller nations
that invested heavily in hydropower were Austria, Yugoslavia, Spain, Latvia and, of course, Norway. In countries such as Greece, however, it soon turned out that the high hopes held for domestic hydropower had been exaggerated, especially in view of radically growing domestic energy needs that quickly outpaced anything that national waterfalls could offer (Arapostathis and Fotopolous, this issue).

Sweden, while unfortunate in terms of its fossil-fuel poverty, caught the great powers’ attention after the Second World War as one of the most promising sites for uranium extraction in Europe (Kaijser and Högselius, this issue). Sweden, in a similar way, was for some time believed to rest on some of the world’s best uranium deposits, although this soon turned out to be a false hope (Camprubi, this issue). One small country that did emerge as a large-scale uranium supplier was Bulgaria. Since Bulgaria relied on the Soviet Union for nuclear technology as well as on most fuel-cycle services, however, domestic uranium mining changed little in terms of Bulgarian nuclear energy dependencies (Tchalakov and Mitev, this issue).

There was one fundamental problem with the import-substitution strategy: domestic energy was often more expensive – and often more hazardous for the environment – than imported energy. Coal mines in many smaller nations were often unable to compete on a free-market basis and their operation was thus as a rule dependent on large tax subsidies, high import tariffs and the like. Even oil and gas production in many cases turned out to be uneconomical, especially when the resources were limited or of a low quality. The situation in uranium mining was not much different. The fact that a range of countries still opted to pursue local fuel production testifies to the perceived critical importance of energy independence. In terms of environmental factors, Francoist propaganda in the late 1940s argued that “northern Spain must sacrifice the beauty of its landscapes for the nation” (Camprubi, this issue); from an energy independence point of view, it did not make sense to protest, as many locals had done for decades already, against local coal-mining, however dirty it may be. Bulgaria, Estonia, Poland and Greece are other examples of countries that in a similar way deliberately sacrificed local environments for the sake of energy independence (Tchalakov and Mitev, this issue; Holmberg, 2008; Cantoni, 2017; Arapostathis and Fotopolous, this issue). Another important – and tragic – case is Japan, which opted to build numerous nuclear power plants on its territory in spite of widespread awareness of disaster risks stemming from earthquakes and tsunamis.

Elsewhere, however, actors opted to sacrifice independence for the sake of economy and environment. In other words, they saw opportunities rather than problems in becoming dependent on other countries. For example, Sweden phased out its uranium mining once an international market for uranium and enrichment services had been established, turning to imports. To this day, despite Sweden being one of the world’s most nuclearized countries, its domestic uranium resources remain unexploited. Imported uranium was cheaper, and in addition imports from abroad meant that the Swedes did not have to cope with any domestic environmental problems relating to uranium mining (Kaijser and Högselius, this issue). Fears of nuclear disasters also made many smaller nations turn to imports. Greece, for example, after years of debate eventually chose not to build any nuclear facility on its territory; instead, the country coped with its electricity shortages through scaled up imports of electricity – much of it, ironically, taking the form of Bulgarian nuclear electricity (Tympas et al., 2013). Italy, in a similar fashion, abruptly shut down its nuclear reactors after the 1986 Chernobyl disaster, only to replace it with nuclear electricity imports from France. Armenia, after the devastating December 1988 earthquake, also closed down its one and only nuclear power plant. This had far-reaching consequences for Armenia’s energy dependence in the turbulent post-Soviet era, and in response to this, one of two decommissioned units were, uniquely, started up again in November 1995 (WNA, 2017).

Coal mining in many European countries has also been gradually phased out in recent decades – not so much because the deposits have been physically depleted, but more because competition from other energy sources and from foreign coal supplies makes extraction economically unviable and because coal mining has come to be regarded as environmentally hazardous. As a result, countries such as Germany and the Netherlands now import large volumes of coal from overseas, notably from the United States, Colombia and South Africa. However, the resistance to the closure of coal mines was often strong from trade unions, not least in Britain. Hydropower projects, designed to come to grips with escalating foreign dependencies, have in many cases also been abandoned due to environmental concerns. The protests in the late 1980s against new ambitious hydropower projects in Latvia and on the Slovak-Hungarian border are probably the most telling examples here (Fitzmaurice, 1995). Sweden’s decision to “protect” four of its major rivers, whose exploitation could have contributed in a significant way to reducing the country’s energy dependence in an economically efficient way, is another case in point (Kaijser and Högselius, this issue).

Arguing along similar lines, Europe would potentially be able to resolve much of its present-day gas dependence on Russia by turning to intra-European shale gas exploration; however, most European nations have opted not to invest in this opportunity, citing environmental and other concerns (Cantoni, 2017). The implication is that the EU’s gas dependence on Russia lingers on.

4. Coping with energy dependence through vulnerability management

All in all, economic and environmental problems of domestic energy sources have provided strong incentives for many countries to continue – and further scale up – energy imports from abroad. Whenever this has been the case, another challenge has come to the fore: to manage vulnerability in the context of energy imports, that is, to cope with – rather than to eliminate – import dependence. Actors have developed a number of methods to achieve this. In the following we discuss the most important ones.

First, actors have sought to diversify their energy imports, both in terms of energy sources and in terms of supplier countries. The vision has been to attain a sound energy mix based not only on one, but on several different fuels, each of which should ideally be sourced from a different set of countries. The idea is, of course, that in case of a supply disruption from a particular supplier the consequences will not be as severe and that the importer may even be able to compensate for the loss by increasing imports from its other suppliers. In addition, diversification has generally been seen as necessary when seeking to counter economic risks in the terms of potential monopoly or oligopoly abuse by dominant suppliers.

Generally speaking, as far as geographies of supply are concerned, smaller countries have found it more difficult to diversify their energy imports than large countries, mainly as a consequence of the small size of their markets. A country such as Luxembourg, to take an extreme example, simply cannot afford to spread its risks by concluding deals with several different oil suppliers or several different coal suppliers. As a result Luxembourg, which does not have any domestic oil refinery, is today almost totally dependent on Belgium for access to oil products and almost totally dependent on South Africa for its coal supplies (IEA, 2017). Still, most small countries have historically been very active in their diversification attempts and they have often been remarkably successful in this respect. The Netherlands in the nineteenth century, for example, managed to counter Britain’s dominance as a coal supplier by drawing on Belgian and German supplies – in a way that by the late nineteenth century started to fuel concerns about German rather than British dominance (Högselius, this issue). Denmark, in the postwar years, similarly found that it could use Polish coal imports to put pressure on the British to come up with attractive offers for coal exports (Rüdiger, this issue). Most smaller nations have also been able to attain a diversified oil import structure – with the oil crisis of 1973/74 as an alarm bell.

Diversification has been more difficult to achieve in natural gas,
mainly because of the prominence of pipe-based transports of this fuel. To this day Sweden remains totally dependent on a single pipeline that brings in gas from Denmark; a rupture here would cause havoc for much of southern and western Sweden (Kajiser and Högselius, this issue). Finland similarly is supplied through a single pipeline from Russia. Spain, for its part, has found it remarkably difficult to diversify its gas imports away from Algerian supplies, although in recent years additional piped gas from Norway along with large-scale LNG supplies from Nigeria and Qatar have yielded greater success (Camprubi, this issue). The most striking cases of non-diversification, however, are in Central and Eastern Europe, where the historical legacy of Soviet gas in combination with lack of capital for new pipeline projects has resulted in a situation where Russia continues to totally dominate the market. Several recent initiatives, however, are arguably bound to change the picture, such as Lithuania’s and Poland’s investments in LNG terminals and various projects that, with ample support from the EU, aim to make Central and East European pipelines reversible (Richter and Holz, 2015). Bulgaria currently hopes to diversify its gas supplies by accessing North African gas; it would be piped through Greece, whereby the Greek hope to attain a new hub position in Southeast European gas transmission (Araposthatis and Fotopoulos, this issue).

The oil crisis of 1973/74 spurred many small countries which, in the 1950s and 1960s, had become overly dependent on imported oil to diversify their energy sources. Denmark’s main response to the oil crisis was to launch an active energy policy, with a parliamentary decision to allow the Ministry of Commerce to directly instruct the country’s power stations which fuel to use. The Ministry instructed the majority of power stations to re-introduce coal as their main fuel, and a costly transition, spanning eight years, followed (Rüdiger, this issue). Sweden too introduced policies to reduce oil consumption not least in district heating plants, where heavy oil was substituted for coal, natural gas and biomass (Kajiser and Högselius, this issue).

Such diversification of energy sources is dependent on access to flexible heat and power plants that can run on different fuels. Hence the construction of such plants can be regarded as a vulnerability-management strategy in its own right. The most ambitious version of this strategy has been to build power plants that without great additional costs can switch from oil to gas, from coal to oil or the like. An important component of Dutch energy policy following the 1973 oil embargo, for example, has been to ensure that oil-fuelled power plants can switch to natural gas (Hölsgens, this issue). However, on a finer level, actors have also tried to make sure that power plants, whether they run on coal, oil, gas, uranium or renewable fuels, are not locked into supplies from a specific coal mine or oil field. Denmark, when seeking diversification away from British coal, thus made sure that coal supplies from Poland would be interchangeable with British and American supplies (Rüdiger, this issue). Ensuring the interchangeability of supplies has at times been costly, however; this was the case, for example, when Bavaria, in the years around 1970, built up a gas supply system based on a combination of supplies from the Soviet Union and the Netherlands; for substitution to be possible in case of a supply disruption from the Soviet Union, expensive conversion equipment had to be installed, because Dutch gas had a much lower calorific value (Högselius, 2013). The often prohibitive costs of such arrangements have, in practice, often led to decisions to accept a greater degree of dependence. During the 1980s, for example, Japan imported much of its oil from the huge Daqing field in northern China, which is of a particularly heavy kind. The Japanese refineries were adapted accordingly, resulting in a lock-in (Högselius, 2015b).

Another method to cope with vulnerability has been to seek state control of energy imports. As already mentioned, the idea that the state should play an active role in energy has a long history, although the main emphasis in the literature has here been on the state’s role in domestic energy production, rather than energy imports. The idea that vulnerabilities stemming from imports could be effectively dealt with through state action started to be discussed in earnest in the context of World War I and its aftermath. In Europe, the Spanish government became one of the first, in 1927, to declare a state monopoly over oil imports and oil refining (Camprubi, this issue). State involvement gained further momentum after World War II, although the state’s quest for control was often controversial. In Sweden, for example, where the state had taken control of energy imports during the war, post-war efforts to form a national oil company eventually failed. The responsible Swedish actors feared that nationalization of oil imports might lead to conflicts with the large international oil companies, on which the country would anyway remain dependent. The conclusion was that the country’s oil import security had nothing to gain from the establishment of a national oil agency (Kajiser and Högselius, this issue). The Danes, too, while not elaborating on the creation of a state oil company, feared possible countermeasures from the international majors in the context of Denmark’s attempts to import large volumes of Soviet oil in the 1950s (Rüdiger, this issue). In natural gas, Denmark did create a wholly state-owned company, DONG, the initial purpose of which was precisely to coordinate gas imports. Only a state company, it was believed, would be able to negotiate in a fruitful way with powerful foreign suppliers (Rüdiger, this issue).

State involvement in energy imports, however, comprises more than state ownership of the importing agencies. More important, but less visible, has probably been the state’s role as a facilitating party in negotiations with prospective fuel suppliers. The most clear-cut example is the participation, during the Cold War, of Western state actors in negotiations with the communist countries. Energy from beyond the Iron Curtain were regarded as a promising option in the quest for diversification, but for the supplies to materialize the state’s involvement was imperative, whether the fuel at stake was coal, oil, natural gas or uranium (see e.g. Rüdiger, this issue, Kajiser and Högselius, this issue, and Arapostathis and Fotopolous, this issue; cf. Högselius, 2013). In this way imports from the communist countries indirectly brought increased state control over nations’ energy imports.

A third method to manage vulnerability has been to develop trustful relations with exporting countries and companies. The overall impression is that small countries have, as a rule, been more pragmatic – and opportunistic – in this respect than large countries. During World War I, for example, the (neutral) Netherlands managed – initially – to avoid coal shortages thanks to a crucial agreement with Imperial Germany through which the Dutch supplied the Germans with food products in return for fuel (Hölsgens, this issue). During World War II, Sweden similarly managed to avoid a national coal crisis by negotiating large coal imports with Hitler in return for Swedish iron ore (Kajiser and Högselius, this issue). Finland, during the Cold War, built up a mutually fruitful cooperation with the Soviet Union in oil, gas, nuclear energy and electricity – a remarkable feat in view of the fact that the two nations had fought against each other twice during World War II (Michelsen, 2013). Finland became more dependent than any other Western nation on Soviet energy supplies. Austria also developed very trustful relations with its eastern neighbours – not only the Soviet Union, but also Czechoslovakia and Yugoslavia (Högselius, 2013; Lagendijk, 2008). Equally pragmatic was the fruitful cooperation that the Greek state utility, PPC, built up with its counterparts in Bulgaria, Yugoslavia and, more recently, Turkey, in the construction of transnational electricity and gas connections. Today the Greeks retain a fruitful cooperation even with the Former Yugoslav Republic of Macedonia – in spite of serious diplomatic disputes between the two countries (Tympas et al., 2013).

When it comes to electricity, most countries have sought self-sufficiency to avoid becoming dependent on imports of this critical resource. However, the Nordic companies developed close transnational cooperation in the 1960s, building high voltage power lines across national borders and exchanging substantial quantities of power. The main advantage was that such exchange could compensate for annual variations in precipitation in different parts of the Nordic region, and reduced the need for fossil fuels in back-up thermal power plants. Thus
the hydro power could be more efficiently utilized. The managers of the major power companies developed a high degree of mutual trust and the power exchange was surprisingly informal, not based on long-term contracts (Kaijser, 1997). Similar transnational cooperation developed in other European regions, notably in continental Western Europe, where, just like in the Nordic region, the national grids of several countries were synchronously interconnected with each other. A number of connections were also set up between the synchronized grids (Lagendijk, 2008).

A related strategy has been to develop trustful relations with other importing countries and companies to strengthen one’s bargaining position vis-à-vis exporters. An early example is the Scandinavian Coal Importers Federation, which was established in 1923 by Danish, Swedish and Norwegian coal companies. The purpose of this Federation was to obtain as favourable trade agreements as possible with British, Polish and German coal exporters by coordinating negotiations (Kaijser and Högselius, this issue). A much more ambitious organization with the aim to strengthen the position of oil importing countries vis-à-vis oil exporters is the International Energy Agency (IEA). It was established in 1974 under the framework of the OECD as a response to the Arab oil embargo, and it was perceived to be of great importance not least for the smaller and less powerful European nations. IEA saw stockpiling of oil as an important measure to decrease the vulnerability of importers and all its members agreed to establish stockpiles corresponding to 90 days of consumption (Van de Graaf and Lesage, 2009).

A further strategy to counter the vulnerability of small countries has been to participate in prospecting, exploration and extraction of fuel resources abroad. The idea here has been that a country that depends on energy imports may lower the risks of supply disruptions and price shocks by taking active part in those foreign upstream activities on which it depends. In the literature, this strategy is usually associated with the activities of the larger nations on the international energy arena, starting with the great powers’ outright invasions of energy-rich nations in the context of the two world wars and leading up to current Chinese investments in African fuel production. The smaller nations, however, have often sought to replicate this great power behaviour and they have been more active in foreign energy ventures than what is usually assumed. One of the earliest examples is the Swedish establishment of a coal mine in Spitsbergen in the early twentieth century, a main motive being to counter Sweden’s problematic dependence on British coal (Avango et al., 2018). The most breath-taking example of Swedish foreign energy activities is the state-owned Swedish electricity company Vattenfall’s success in taking over nearly one-third of the German electricity market, including ownership and control of several lignite mines in the former GDR; these activities, however, can hardly be interpreted as moves taken to counter Sweden’s energy dependence (Högselius and Kaijser, 2010, 2007).

The Danish and Spanish governments both sought to emulate the aggressive activities of the large imperial powers by exploring their colonial possessions for energy resources, ranging from uranium in Greenland (Nielsen and Knudsen, 2013) to oil and gas in Spanish (now Western) Sahara. Spain’s Saharan oil exploration, however, was heavily dependent on cooperation with mostly American oil companies (Camprubi, this issue). The Netherlands arguably had an advantage over other smaller nations not only in terms of the fabulous oil riches of the Dutch East Indies, but also in terms of Royal Dutch Shell being a largely Dutch oil company with great muscle on the international arena. It is difficult to judge whether Shell’s market power actually contributed to lowering Dutch oil import vulnerability. It is interesting to note, however, that Netherlands Antilles came to host a key refinery in which Shell processed Venezuelan oil during the Interwar era, and that supplies from this refinery played an important role in Dutch oil imports.

Even Bulgaria, which in the literature about the Cold War period is often thought of as locked up behind the Iron Curtain, set out to cope with oil import dependence by participating in foreign upstream activities. In this case the main producer country at focus was Libya. The friendship between Bulgaria’s political leader Todor Zhivkov and Libyan dictator Muammar al-Gaddafi enabled the Bulgarians to obtain a production-sharing agreement in Libya, in a way that was seen to reduce Bulgarian oil import vulnerability (Tchalakov and Mitev, this issue).

5. Conclusions

As the case studies in this special issue show, the nature of small countries’ energy dependence, their efforts to cope with dependence and the evolution of energy dependencies over time differs strongly from one national setting to the other. The ensuing articles highlight the diversity of small and less powerful nations’ dependency experiences by exploring the experiences of Sweden, Denmark, the Netherlands, Spain, Greece and Bulgaria, thus comprising cases from very different European regions: the Nordic region, Western Europe, Southern Europe and ex-communist Eastern Europe.

In spite of the diversity of energy dependence experiences, however, there are clearly also numerous similarities. Taken together, the evidence discussed in this introductory article – which in addition to our six in-depth case studies comprised examples from numerous other smaller nations – allow us to discern a number of broader patterns. First of all, it should here be emphasized that the dependency experiences of smaller nations do not necessarily differ in all respects from those of the larger and more powerful nations. Clearly, the basic challenge of securing sufficient fuel and electricity from abroad is one that is shared by smaller and larger nations. While China, India and Germany are thus all struggling to make sure their need for imported oil is met, so are Sweden, Estonia and Luxembourg. Being dependent on imported oil, small and large countries alike fear price hikes, turmoil in the producing countries and disrupted supplies. They have to a large extent also adopted similar strategies to cope with vulnerability, especially when it comes to their energetic attempts at import substitution and the exploration of domestic fuels, but also in terms of strategies such as diversification or increased state control over energy imports. We have shown that the similarities between large and small countries may, as a matter of fact, be more far-reaching than what the conventional wisdom indicates. For example, smaller nations have been surprisingly active in terms of foreign activities as a way to manage energy dependence; in no way have they been passive players waiting for market forces or great power politics to sort out one or the other problem. Moreover, a range of smaller nations have managed to place themselves in “hub” positions, thus strengthening their position in – and power over – transnational flows of fuel and electricity.

But energy dependence of small countries also differs from that of the larger nations in several ways. A systems perspective reveals that smaller countries are typically in a more troublesome position – and more so than the larger nations – than what aggregate statistics of energy imports reveal. This is because smaller nations have fewer possibilities to control an entire energy system than large ones. Large nations generally have more energy sources within their boundaries – or, alternatively, in colonies or countries over which they can exert considerable control. They also have a wider range of technological options at their disposal, and a higher capacity to develop new technologies. The general geopolitical weakness of smaller nations further translates into fewer options for putting pressure on foreign actors to live up to their contractual obligations. However, as pointed out in this article, there are also a number of intriguing exceptions from this overall pattern, so that small countries sometimes end up in surprisingly strong positions.

In terms of vulnerability management, smaller nations have found it more difficult to diversify their energy imports than the larger nations and they have found it less economically feasible to store fuel for emergency supply purposes. Being small, however, has at times also been identified as a positive thing. To the extent that the development of trustful relations with exporting countries and companies has been
crucial in coping with vulnerability, for example, the smaller nations have as a rule had an advantage precisely because they have been smaller nations have been and continue to be very active players in energy geopolitics and in international energy markets, having a range of strategies and measures at their disposal. It is imperative for any analyst of energy and geopolitics to seriously take these players into account.

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