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## Energy Security in the Euro-Mediterranean Region

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### I. Introduction

Energy is formally defined as the ability or capacity to do work. The command of energy thus plays a fundamental role for societies, setting the outer limits of what can be accomplished by communities, nations, or any social entity.<sup>1</sup> Energy security has been defined in many different ways,<sup>2</sup> but essentially exists whenever the energy supply is large and reliable enough to support a community's societal, economic and military activities. In the context of the Euro-Mediterranean region, energy security has two main aspects. First, the provision of adequate energy services in countries of the Southern and Eastern Mediterranean rim, where higher per capita energy consumption would be expected to enhance development and political stability. Secondly, the importance of the Mediterranean Sea for energy transits towards the European Union. Ultimately, both these aspects are related, as increased stability in the Mediterranean will allow the European Union to better safeguard the energy flows through the region.

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<sup>1</sup> Weissenbacher, Manfred, 2009: *Sources of Power- How Energy Forges Human History* (Volume One): *The Ages of Foraging, Agriculture, and Coal* (Volume Two): *The Oil Age and Beyond* (Santa Barbara/Denver/Oxford: Praeger/ABC-Clio).

<sup>2</sup> Sovacool lists 45 different definitions of energy security found in the policy and scholarly literature. Sovacool, Benjamin, K. (Ed.), 2011: *The Routledge Handbook of Energy Security* (Abingdon, Oxon: Routledge).

## II. Energy security in Southern and Eastern Mediterranean countries

With regards to the first aspect and the claim that an increase in energy consumption would stimulate stability and development in less-developed countries, it has been observed that per capita energy consumption positively correlates with human development.<sup>3</sup> This correlation is especially strong during the earlier stages of development, while excessive energy inputs in highly developed societies will not result in any further human well-being. Energy inputs of 1 tonne of oil equivalent per capita per year seem to be sufficient to achieve high, *albeit* not very high, human development. (Human development is typically quantified through the United Nation's Human Development Index, HDI, combining health, education and income indices.) In the Southern Mediterranean, this is indeed the level of energy consumption. In Algeria, for instance, a primary energy consumption of 41.1 million tonnes of oil equivalent per year and a population of 35 million combines to 1.17 tonnes of oil equivalent per capita. Similarly, Egypt's population of 82 million consumes 81.0 million tonnes of oil equivalent in terms of primary energy, resulting in a per capita consumption of 0.99 tonnes of oil equivalent, while the figure is 1.41 tonnes of oil equivalent per capita per year for Turkey. Meanwhile, France consumes energy at a level of 3.86 tonnes of oil equivalent per capita per year, Spain 3.20 tonnes of oil equivalent per capita per year, and Italy 2.82 tonnes of oil equivalent per capita per year.<sup>4</sup>

Socio-economic indicators demonstrate that substantial disparities remain between the northern nations compared to nations of the Southern and Eastern rim of the Mediterranean, as would be expected according to energy consumption patterns. The

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<sup>3</sup> Ibid.: 1.

<sup>4</sup> Population Data: July 2011 estimates from: Central Intelligence Agency (2011, July). *The World Factbook*. Available at: <https://www.cia.gov/library/publications/the-world-factbook>; Energy Data: BP. (2011, June). *Statistical Review of World Energy*. Available at: <http://www.bp.com/statisticalreview>.

French are more than five times as wealthy as the Egyptians in terms of per capita GDP, and about a fifth of the population in Southern Mediterranean countries lives below the poverty line. A person born in Italy can currently be expected to live about nine years longer than one born in Turkey or Egypt. Practically the entire population of the northern Mediterranean rim is literate, while around 30 percent in the south cannot read and write. Also, there are large differences between the percentage of adult males and adult females that are literate in North African Mediterranean nations. In Egypt and Algeria, for instance, 40 percent of females above 15 years of age are illiterate. In Egypt more than half of the population lives on the country-side, while it is 15 percent in France.

Fertility and population growth rates are also in line with expectations based on energy consumption and other trends. In the wealthy, fully-industrialised nations of Mediterranean Europe, total fertility rates, quantifying the average number of children born per woman, are below, or even well below, replacement level. Two children (surviving until reproductive age) are necessary to replace father and mother, and to keep the population size constant. But in Italy, Spain, and France, according to 2011 estimates, total fertility rates are 1.39, 1.47, and 1.96 children per women, respectively. The very slight positive population growth rates in these countries of aging populations are thus sustained by somewhat higher birth than death rates combined with net immigration rates. Egypt, on the other hand, has a total fertility rate of 2.97, i.e. three children are on average born per woman, Turkey of 2.15, and Algeria of 1.75. The resulting annual population growth rates are 1.96 percent for Egypt, 1.24 for Turkey, and 1.17 for Algeria. These growth rates may sound low at first glance, however, a population growing at 1.96 percent per year doubles within 35 years. Such time frame is very relevant with regards to energy infrastructure, which requires large investments and long-term planning.

The situation described implies that a lot more energy will be needed in Southern and Eastern Mediterranean nations, not just to

stimulate development for the current population size, but to maintain or increase the current level of per capita energy consumption, despite the relatively large population growth. Moreover, the economies of the South and East are largely at a different stage of maturity compared to those of the Northern Mediterranean rim. In the North, economies have shifted much of their revenue base from production to the less energy-intensive service sector, while non-EU Mediterranean regions currently tend to follow the classic industrialisation path via the build-up of a strong manufacturing base. For all the above reasons, energy demand is expected to grow a lot more in the South and East compared to the North. Energy demand is expected to roughly double in the Southern and Eastern Med countries between now and 2030, while the population will grow by nearly 30 percent. According to projections by the Mediterranean Energy Observatory, primary energy demand of the Southern and Eastern Mediterranean countries (SEMCs), where the majority of the Mediterranean population lives, will increase from 33 percent of the total demand in the Mediterranean region in 2010 to 40 percent in 2020 and 42 percent in 2030. (Per capita consumption will, however, still remain substantially larger in the northern Mediterranean basin.) Meanwhile, total energy demand in the Mediterranean is projected to increase by 40 percent within 20 years.

It will be crucial for the Southern and Eastern Mediterranean countries to secure adequate energy supplies, despite the growing demand, in order to sustain further development. The region of the SEMCs as a whole does, in fact, have a large resource base, and there are several net fossil fuel exporters: Algeria, Egypt, Libya, and Syria. Algeria ranks 16<sup>th</sup> in global oil reserves, has the eighth-largest reserves of natural gas in the world, and is the fourth-largest gas exporter. Consequently, the Algerian economy is largely based on hydrocarbon revenues, which account for roughly 60 percent of budget revenues, 30 percent of GDP, and over 95 percent of export earnings.<sup>5</sup> The Libyan economy similarly

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<sup>5</sup> Central Intelligence Agency, 2011, site.cit.

depends strongly on revenues from the oil sector, which contributes about 95 percent of export earnings, 25 percent of GDP, and 80 percent of government revenue. Libya had 46.4 billion barrels of oil in terms of proved reserves by the end of 2010, which equals to 3.40 percent of total proven global reserves.<sup>6</sup> (For comparison, Saudi Arabia had 264.5 billion barrels by the end of 2010) Tunisia has recently become a net importer of fossil fuels, while Egypt keeps exporting natural gas though it has turned into an oil importer. Algeria and Libya, on the other hand, are expected to remain net exporters of both oil and gas beyond 2030. Whether the region's fossil fuel importers, namely Morocco, Tunisia, Israel, Jordan and Turkey, can in fact benefit from these resources, will ultimately depend on future levels of regional cooperation.

Currently, countries of the region that do not produce fossil fuels jointly depend to 80 percent on energy imports, and are thus highly vulnerable to price fluctuations. Energy importing countries in the Maghreb receive no more than 1.4 percent of the exports of hydrocarbons from their neighboring producers Algeria and Libya, while sourcing their energy supplies from other regions, despite higher transportation cost.<sup>7</sup> Further east, things are a bit different. Egypt delivers natural gas to Israel and Jordan, but the situation changed after the toppling of Hosni Mubarak's government. In what appeared to be another act of sabotage, the third attack on Egyptian pipeline infrastructure within six months was reported on 4 July, 2011. Egyptian natural gas exports to Jordan and Israel again came to a complete halt following the blast, and the previous explosion repairs had taken over a month before gas deliveries could resume. Jordan imports 95 percent of its energy needs, and is highly dependent on Egyptian gas imports for electricity production. (As a result of the attacks, Jordan had to switch electricity production to fuel oil, which turned into an expensive

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<sup>6</sup> BP, 2011, site.cit.

<sup>7</sup> Joffé, George; Allal, Samir; Allal, Houada Ben Jannet, 2009: *Energy and Global Economic Crisis: The Chances for Progress*, "10 Papers for Barcelona 2010" series, European Institute of the Mediterranean (IEMed) & European Union Institute for Security Studies (EUISS) (Barcelona: GAM).

affair.) Israel sources some 40 percent of its natural gas consumption from Egypt. Both gas supply deals have been criticised from the start. The 7.4 billion euro 20-year contract signed with four Israeli firms has been challenged in Egyptian courts, on the grounds of its secretive clauses and because it was done without parliamentary consultation, while the 14-year deal signed in 2002 with Jordan stipulated a discounted price, well below international natural gas market prices.<sup>8</sup>

International natural gas prices are actually also behind another potential destabilising factor, with regards to quite a different kind of energy security. Energy security is associated with social security, economic security, and military security (destructive energy), but also refers to food security. Food is nutritional energy, and traditional subsistence agriculture is the art to utilize solar energy by turning it into edible material, for humans (and to some extent beasts of burden) to consume and be able to work. However, as societies proceeded through the Coal Age and Oil Age, they turned agriculture, their first great source of energy, into an energy sink.<sup>9</sup> Nowadays the inputs of technical energy into food production are substantially larger than the solar energy captured on the fields. The enormous energy inputs that go into fertiliser production are a major factor in this system, but without synthetic fertilisers a large share of the world population would now not be able to survive. Natural gas prices influence fertiliser prices, because natural gas is the feedstock for industrial hydrogen production, with hydrogen being consequently reacted with nitrogen into ammonia that is reacted into nitrogen-fertilisers. Natural gas prices, which often follow oil prices, thus have a strong influence on food prices.

Another major factor in food production is irrigation, which, on the one hand, can tremendously boost agricultural outputs, but, on

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<sup>8</sup> “Gas exports to Jordan stop, second bomb found after pipeline explosion”, *Al-Masry Al-Youm* (4 July 2011). Available at: <http://www.almasryalyoum.com/en/node/474215>.

<sup>9</sup> Weissenbacher, Manfred, 2009, art.cit.

the other hand, tends to be expensive in terms of energy. In various arid Mediterranean regions, households, production industries, tourism, agriculture and other sectors compete for scarce fresh water resources, and where desalination plants need to be employed, these energy inputs add to the pumping that is necessary to run irrigation schemes. Indeed, it has been argued that traditional Mediterranean food exports in the form of fruit are decreasing the energy and food security in the region due to the high water content of these exports.<sup>10</sup> However, food insecurity is quite generally a major contributor to instability in the Southern Mediterranean. Libya imports as much as 75 percent of its food, for instance, while the only country in the Southern and Eastern Mediterranean region to consistently produce food surpluses is Turkey. It is thus not surprising that the “Arab Spring” events starting in December 2010 had somewhat of a test run during a period of high food prices in 2008, when Morocco, Algeria, Tunisia and Egypt all experienced severe riots.

### **III. Energy security in the European Union**

If we now turn our attention to the role of the Mediterranean region for the European Union with regards to energy security, it is worth noting that some 65 percent of the oil and natural gas consumed in Western Europe passes through the Mediterranean each year.<sup>11</sup> Such imports are bound to increase markedly, as the domestic resource base is dwindling. Britain is the oil-richest country within the European Union, but British oil production began to decline in 1999. (Similarly, Norway is a substantial oil producer, but production peaked in 2001.) While Britain remained a net oil exporter even after the peak production, Germany, France, Italy and Spain are among the world’s top ten oil importers, and imports into the EU as a whole rose by 29 percent

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<sup>10</sup> Joffé, George; Allal, Samir; Allal, Houda Ben Jannet, 2009, art.cit

<sup>11</sup> North Atlantic Treaty Organisation (NATO) (2011, May 25). *NATO’s role in energy security*. Available at: [http://www.nato.int/cps/en/natolive/topics\\_49208.htm](http://www.nato.int/cps/en/natolive/topics_49208.htm).

within ten years between 1996 and 2006. By 2010, proven reserves of 6.3 billion barrels of oil and a domestic production of just below two million barrels per day did not exactly look favourable compared to a consumption of nearly 14 million barrels per day. 86 percent of the consumed oil had to be imported, and by 2030 it will be 93 percent under a “business as usual” scenario.<sup>12</sup> The situation looks slightly better with regards to natural gas, where a production of 174.9 billion cubic metres in 2010 compared to a consumption of 492.5 billion cubic metres, translating into 64 percent imports (projected to rise to 75 percent by 2015 and 84 percent by 2030), while proven reserves accounted to 2.4 trillion cubic metres by the end of 2010.

The European Union has attempted to hedge against supply risks by diversifying its oil and gas imports. Of 12.094 million barrels of oil imported daily into Europe<sup>13</sup> in 2010, 5.982 million barrels came from the Former Soviet Union, 2.355 million barrels from the Middle East, and 1.677 million barrels from West Africa.<sup>14</sup> (In 2002 the EU received 28 percent of its oil imports from Eastern Europe (mainly Russia), 25 percent from the Middle East, 21 percent from Africa, and 20 percent from Norway.) The large Russian oil import shares are only sustainable in the short run, as current Russian reserves-to-production (R/P) ratios are low, at about 20 years, compared to roughly 75 years for Saudi Arabia or Libya, for instance. The large and rapidly increasing share of the Middle East compared to all other global oil reserves, combined with the political instability that persists in this region,

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<sup>12</sup> Commission of the European Communities, 2007: *An Energy Policy For Europe* (Brussels: European Union)

<sup>13</sup> “Europe” here refers to: Albania, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Gibraltar, Greece, Hungary, Iceland, Italy, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of Ireland, Romania, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the UK.

<sup>14</sup> BP, 2011, site.cit.



has prompted the European Union to attempt to shift more energy consumption from oil to natural gas.<sup>15</sup>

With respect to natural gas, the resource base of Russia is a lot larger: the Russian Federation has 24 percent of global proved gas reserves and a current reserves-to-production ratio of 76 years. The “North Stream” pipeline, scheduled to deliver natural gas from Russia to Germany through the Baltic Sea from October 2011, is to reduce “gateway risk” by assisting traditional pipelines from Russia, and so would the proposed “South Stream” pipeline that runs from Russia through the Black Sea to Bulgaria and further into Europe. However, these projects are increasing the European energy dependence on Russia. Proponents of such pipeline projects emphasise that Russia has been a reliable energy supplier to Western Europe even during the Soviet period; that Russia is a major non-OPEC supplier of oil and natural gas; and that as long as the Russian economy is not more diversified and energy exports play a vital role for the country’s economic well-being, Russia will undoubtedly maintain good relations with its energy customers.

Opponents, on the other hand, claim that Russia, by controlling energy supplies, exerts undue economic and political power over Europe, even if not exercised at the moment, and point at the Russo-Ukrainian gas dispute of January 2009, during which 20 percent of Europe’s gas supplies were cut off for two weeks. Thus, various strategies have been suggested to decrease the European Union’s energy dependency on Russia, its number one oil and gas supplier. One is to build up more liquefied natural gas (LNG)

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<sup>15</sup> To be sure, this is a somewhat bold statement. The strategic importance of oil stems from the fact that it accounts for most energy used for transport. There is currently no alternative that matches oil with regards to properties and price. While natural gas can be used directly to power cars with internal combustion engines, natural gas notably creates the least amount of carbon dioxide per kWh of electricity produced in power plants compared to other fossil fuels. Such electricity can in turn power electric vehicles. Natural gas is also the raw material for industrial hydrogen production. Hydrogen can be used to power fuel cell vehicles.

infrastructure, which is expensive but allows for international natural gas imports independent from pipeline networks. An alternative strategy is to shift more energy transit from Eastern Europe to the Mediterranean.

#### **IV. Energy transits through the Mediterranean**

Pipeline projects have proliferated rapidly during the past years in just about every corner of the Mediterranean. Turkey, at the north eastern end, occupies a strategic location of special geopolitical importance. Turkey borders oil-rich Iraq (with two great oilfields, around Mosul and Kirkuk, being located within 150 km of Turkey's border), and its Mediterranean port of Ceyhan is the primary terminal through which Iraq's northern oil exports pass. Turkey also transits oil arriving from Russia, the Caucasus, and the Caspian region. This oil, if arriving in the Black Sea to be moved to the Mediterranean, has to be shipped through Turkey's Bosphorus Straits. For alternative transport of such oil, a pipeline is being constructed from Samsun, at Turkey's northern, Black Sea coast to Ceyhan, at Turkey's southern, Mediterranean coast. (At a length of 550 km, and a maximum daily capacity of 1.5 million barrels of crude oil, this pipeline will potentially transport some 70 million tonnes of oil, chiefly from Russia and Kazakhstan, per year to relieve oil transits through the highly-populated area along the Bosphorus Straits.)

Furthermore, Turkey's Mediterranean Ceyhan port is the end-point of the Baku-Tbilisi-Ceyhan (BTC) Pipeline, the first transnational pipeline that transports Caspian oil without crossing Russian soil. Operational since 2006, this 1,768 km crude oil pipeline transports a million barrels of oil a day from Azerbaijan through Georgia into Turkey. (The construction of this pipeline was politically charged, because unstable Georgia viewed this project as an opportunity to somewhat rid itself of Russian influence. Moscow, on the other hand, has put pressure on Georgia not to attempt joining NATO (and the European Union), but Georgia is still working on becoming a (full) NATO member.

With regards to natural gas, the 3,893 km Nabucco pipeline, expected to be operational from 2017, will be constructed to transport gas from Turkey via Bulgaria, Romania and Hungary to Austria, from where it can be further distributed. As a major gas pipeline that doesn't touch upon Russian ground, it will decrease European energy dependence on Russia, as well as diversify gas supply routes. Iraq and Azerbaijan (and potentially Turkmenistan, Kazakhstan, and even Iran) will be the main suppliers for the Nabucco pipeline, but it could also be filled with Russian gas transported across the Black Sea to Turkey through the Blue Stream pipeline. Additionally, a gas pipeline connection is planned between Turkey and Syria, to be integrated with the Arab Gas Pipeline that delivers Egyptian gas to Jordan, Syria, Lebanon, and Israel. It will thus eventually be possible to deliver Egyptian gas through this network and the Nabucco pipeline via Turkey into central-western Europe. (Currently most of Egyptian gas exports are in the form of LNG.)

Well aware of Turkey's strategic position, the European Union in 2005 began the formal accession framework for Turkey to become a full member of the EU. The European Union has asked Turkey to work towards further economic reform and liberalisation, and has repeatedly complained about the human rights situation in Turkey. But even though Turkish efforts to achieve EU membership have so far been denied, the European Union has attempted to widen its influence in Turkey. This has at times turned into a struggle against U.S. American influence. NATO-member Turkey became the third largest recipient of US military aid in the early 1990s, behind Israel and Egypt. Notably, NATO, after being forced to redefine its role after the end of the Cold War, has in recent years adopted a strong agenda with regards to securing energy transits into Europe.<sup>16</sup> Assuming this task, NATO ships have been patrolling in the Mediterranean for years, providing escorts to non-military shipping and concentrating on "choke" points (formed by narrow waterways and straits) as well as important passages and harbours.

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<sup>16</sup> NATO, 2011, site.cit.

One such “choke point,” the Suez Canal, makes Egypt unique among the nations along the North African coastline with regards to energy transits into Europe. However, the trend towards larger carriers has strongly decreased the energy importance of this waterway, as ‘very large crude carriers’ (VLCCs) are now too large for the Suez Canal, while competitively shipping oil around the African Cape. Though the region retains importance due to the Suez-Mediterranean (Sumed) crude oil pipeline, and increased LNG shipments through the canal, the role of Algeria might now be considered far more important for the European Union in energy terms, when compared to Egypt (and, for the time being, Libya).

In a 2011 academic journal paper (Marín-Quemada and Muñoz-Delgado, 2011) describing a new methodology for the analysis of international energy relations that enables the relationship between any given country and other countries or regions to be classified in terms of the competition (rivalry) and complementarities (affinity) between them, Algeria ranks third behind Norway and Russia with regards to an index listing countries from highest to lowest affinity towards the European Union (while Syria (7th), Tunisia (10th) and Egypt (14th) are all assigned much lower indices).<sup>17</sup> Algerian natural gas has long been delivered to Europe through a western pipeline running through Morocco into Spain, and an Eastern one running through Tunisia to Sicily. In addition, a new direct submarine pipeline from Algeria to Spain through the Mediterranean has recently been opened. Similarly, a gas pipeline from Libya to Sicily would have been operational by this stage, but was closed due to the current situation in Libya. In short, every single North African nation in the Mediterranean plays an important role in either energy production or transit, or both, for the European Union.

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<sup>17</sup> Marín-Quemada, José María; Muñoz-Delgado, Beatriz, 2011: “Affinity and rivalry: energy relations of the EU”, in: *International Journal of Energy Sector Management*, 5,1: 11–38. This article is based on the REACCESS Project (Risk of Energy Availability: Common Corridors for Europe Supply Security) of the VII European Union Framework Program (Subject: Energy-2007-09. 1-01; Grant Agreement No. 212011).

## V. Euro-Mediterranean Regional Cooperation Initiatives

It is thus not surprising that the European Union supports regional cooperation projects and aims to create a more integrated Mediterranean energy market. In fact, there has been a focus on energy ever since the launch of the Euro-Mediterranean Partnership (EMP) in 1995. Regional cooperation projects, funded under the European Neighbourhood and Partnership Instrument (ENPI), include:<sup>18</sup>

- **MED-REG II - Energy regulators:** Supports the development of a modern and efficient energy regulatory framework in the Mediterranean Partner Countries and strengthens their cooperation with EU energy regulators.

- **MED-EMIP - energy cooperation:** A platform for energy policy dialogue and exchange of experiences, leading to enhanced Euro-Med cooperation, integration of the energy markets and improved security and sustainability.

- **MED-ENEC II - Energy efficiency in construction:** Encourages energy efficiency and the use of solar energy in the construction sector, through capacity building, fiscal and economic instruments and pilot projects.

- **Electricity market integration:** Supports the development of an integrated electricity market between Algeria, Morocco and Tunisia and between these three Maghreb countries and the EU, through the harmonisation of their legislative and regulatory framework.

- **EAMGM II – Euro-Arab Mashreq Gas Market Project:** Supports the development of an integrated gas market, in order to create a regional gas market and as a step towards integrating with the EU gas market.<sup>19</sup>

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<sup>18</sup> EU/ENPI Info Centre (2010). *The Mediterranean Solar Plan*. Available at: <http://www.enpiinfo.eu/files/interview/Mediterranean%20Solar%20Plan.pdf>.

<sup>19</sup> For additional information on the Euro-Arab Mashreq Gas Co-operation Centre, see: <http://www.eamgcc.org>.

The ultimate goal, in addition to a similar natural gas pipeline network, is to create a kind of electricity “supergrid” that covers EU member countries, as well as the Southern Mediterranean neighbours. Submarine ‘high-voltage direct current’ (HVDC) connections for electric power transmission have been proposed along the same routes as have been described for gas pipelines. (Algeria-Spain; Algeria-Sardinia; Tunisia-Sicily; Libya-Sicily) Hopefully, such a “supergrid” will in the future transmit significant shares of electricity produced from renewable sources. To utilise more renewable energy is yet another strategy through which the European Union can enhance its energy security, and it comes with the additional benefit that it can reduce the emission of climate-altering greenhouse gases associated with the use of fossil fuels. The European Union has thus committed itself to the “20-20-20” targets, that is, a reduction in EU greenhouse gas emissions of at least 20 percent below 1990 levels; for 20 percent of EU energy consumption to come from renewable resources; and a 20 percent reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency. Directive 2009/28/EC, laying out the rules with respect to reaching the renewable energy share goals by 2020, allows for member states to achieve their national targets by investing into renewable electricity installations in “third countries”, given that the produced electricity is being consumed in any member country. However, member states do not usually view this as an attractive option, simply because their governments prefer to invest in renewable energy to create local employment and increase national energy security.

Nevertheless, producing electricity from renewable sources in the Southern Mediterranean nations for consumption in Northern Mediterranean countries is indeed a viable option, and the European Union has expanded its renewable energy plans towards the south. The Mediterranean Solar Plan (MSP) is one of six key initiatives of the Union for the Mediterranean (UfM), launched in Paris in 2008, and includes two complementary goals: developing 20 GW of new renewable energy production capacities, and achieving significant energy savings around the Mediterranean by

2020. The European Commission supports the objectives of the Mediterranean Solar Plan through capacity building projects, as well as through its financial support to the European Investment Bank's Facility for Euro-Mediterranean Investment and Partnership (EIB/FEMIP), and the Neighbourhood Investment Facility (NIF). Cooperation with international financial institutions, including the World Bank Clean Technology Fund, is an essential part of the Mediterranean Solar Plan, and so is support for industrial renewable energy initiatives such as the French MEDGRID, focusing more on power transmission, and the German DESERTEC initiative, focusing more on electricity production.

The attraction of such initiatives has to be viewed within the overall potential and limitations of renewable energy. Though everyone would agree that we would all like to live our lives supported by inexpensive, clean and abundant renewable energy, there are a few drawbacks. Renewable energy tends to be more expensive than fossil energy, with externalities being somewhat irrelevant in the real world as long as they remain excluded from market prices. Renewable energy tends to be intermittent, with solar energy, for instance, delivering during the daytime only, and inexpensive, large-scale energy storage solutions, besides pumped hydroelectricity, still lacking. And renewable energy sources tend to have low energy intensity per unit area, while people are living increasingly in concentrated urban settings. But here recent technology developments have started to make the idea of harvesting renewable energy in North African countries, and delivering it to Europe, more attractive. First of all, North African countries, stretching deep into desert regions, are less densely populated than European countries. Also, these countries exhibit excellent conditions to harvest wind and especially solar energy.

The DESERTEC initiative, for instance, is thus based to a large extent on two technologies. One, for electricity generation, is Concentrated Solar Power (CSP), which is much more efficient than photovoltaic installations and involves mirrors concentrating solar radiation on a tube or tower to heat a liquid to create steam

driving a conventional turbine. Such plants are ideal where a lot of space is available and have been demonstrated in South Western U.S., for instance. Two, for electricity transmission, an energy grid of high-voltage direct current (HVDC) power lines, which can transmit electricity with energy losses as low as 3 percent per 1000 km. In short, such concepts are sound from the technological standpoint, though there remain questions with regards to grid stability and energy storage. However, most importantly it has to be ensured that such projects will indeed entail technology transfer and capacity building in the south, and that host countries do not just end up being exporters of renewable energy. To stimulate development, electricity generated this way needs to serve, first of all, local needs, and only surplus power be exported.

## **VI. What do the current developments mean for the energy security in the region?**

At the time of writing, outright wars are being waged in Libya and Syria, and the Egyptians feel they have been robbed of their revolution by the military. Though the optimist's view would be that this is merely a transitional state that will ultimately give way to a more free, democratic and prosperous Mediterranean that will allow for a better cooperation between the North and the South, the immediate situation is largely characterised by decreased stability. As energy security requires long-term planning, instability is disastrous. Investments into renewable energy are affected the most. The "fuel" tends to be free for renewable energy regimes, and yet renewable energy is more expensive than fossil energy. This implies that most of the lifetime cost of renewable energy installations is incurred up front, while it is only a quarter of the cost in case of a natural gas power plant, for instance. The DESERTEC initiative, aiming to utilise Saharan concentrated solar power to cover 15 percent of Europe's electricity demand by 2050, requires an investment of some 400 billion euro. To attract investments of this magnitude, stability will be required more than anything, and no government in Europe will base much of its energy security on power lines coming from unsteady regions.



That said, the current atmosphere of instability is not restricted to the Southern and Eastern Mediterranean.

On the contrary, it looks as if much of the Mediterranean, as it once was, might collapse altogether. The Greek economy has been rescued, for the moment, by other EU member countries (and Portugal received bail-out loans as well). Spain keeps on struggling, and might be stumbling; and the collapse of Italy, owing about a quarter of all government debt in the euro zone, has become a nightmare scenario, with unpleasantly real potential and tremendous dimensions. It might simply be impossible to rescue an economy as large and indebted as that of Italy. (The full lending power of the euro area's main bail-out fund, the European Financial Stability Facility, EFSF, is €440 billion.) As energy consumption is as much the result as the cause of economic well-being, a further economic downturn in the northern Mediterranean would dampen the growing energy demand in the Mediterranean. However, the most relevant result would be that the European Union would be less willing and able to finance Euro-Mediterranean cooperation projects.

On the bright side, any period of change will bring about opportunities. New governments in the Southern and Eastern Mediterranean might be straightening out many of the issues currently criticised. They might collaborate more with one another, and follow a track that mirrors some of the European Union's achievements. (The European Commission has, for instance, promoted the idea of EU member countries speaking with "one voice," gradually moving away from the member states' total energy sovereignty and closer to a common energy policy, in order to strengthen the union's bargaining power with third countries in energy matters.) They might harmonise rules and standards at the regional level, and reduce the massive subsidies to energy consumption. (Electricity System Average Rates vary from 1,9 euro cents per kWh in Egypt, and 3,5 Euro cents per kWh in Algeria to about 6 euro cents per kWh in Morocco and Tunisia, while the respective figures for the EU-27 are about nine euro cents per kWh for industry and ca. 16 Euro cents per kWh for

residential consumers. Similarly, a liter of diesel in 2008 cost eight times less in Algeria than in Italy.<sup>20</sup>) The new governments might also attempt to decrease the region's energy import and fossil fuel energy dependency, invest in energy efficiency measures, and accelerate the development of renewable energy options. All these measures will be necessary to allow this region of soaring projected energy demand to prosper.

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<sup>20</sup> Koehler, Michael, 2011: "Energy challenges in the Mediterranean", Presentation for the 30th Information and Training Seminar for Euro-Med Diplomats, MEDAC, University of Malta; Malta, 14 May.