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EMPOWERING EUROPE

Energy, Security, and Environment

Lifelong Learning Programme

UNIVERSITÀ DEGLI STUDI FIRENZE

School of Political Science

Preface

The School of Political Science of the Università degli Studi di Firenze is pleased to present the third newsletter of its new course on the fields among energy, environment and international relations at European level.

The course "Energy, Environment and European Security" aims at presenting a comprehensive analysis of the issues of energy, environment and European policy from a strong multidisciplinary perspective, as this new course encompasses three different disciplines (Energy Economics, Environmental Economics and International History).

The course, entirely taught in English, is part of the postgraduate program in International Relations and European Studies.

Lecturers are Rossella Bardazzi, Maria Grazia Pazienza, and Alberto Tonini, associated professors at the School of Political Science. Being part of the Lifelong Learning Programme, the course has been awarded as a Jean Monnet Module by the European Union order to enlarge and deepen the field of European integration studies. This funding support is employed to finance both incoming professors (seminars and visiting professors from other countries) and short exchange periods for students interested in theses on energy issues (incoming and outgoing).

This newsletter is intended to stimulate the debate on energy issues and to promote the activities, which have been proposed during the entire course, to the international academic and non academic network.

This third issue focuses on a cycle of lectures held by different guests on different energy topics such as the EU energy technology approach towards 2050, the 21st century energy challenges for Turkey and the implications of new types of gas supply in the US.

Practical information and links close the newsletter.

Disclaimer

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A new EU energy technology policy towards 2050: which way to go?

Dr. Sophia Ruester - German Institute for Economic Research / DIW Berlin

Important challenges have to be faced by policy makers if the EU climate policy goal of reducing greenhouse gas (GHG) emissions to 80-95% below 1990 levels by 2050 is to be reached. Understanding which way will be taken by EU towards 2050 is quite difficult since many factors may influence the pathway towards a new energy technology environment. In order to better understand which way will be taken, it is necessary to assess some of the key points reached in the energy sector.
For example, the liberalization of the electricity sector came through three steps in three different years: 1996, 2003, and 2009. The first step regarded the generation side; it was necessary to let competition spread out. So the barriers to the participation in the market were removed. The second step changed the transmission and distribution sector letting third party access to infrastructures. Finally, in 2009 the EU intervened on retail and wholesale markets. As a consequence, the final consumers are now able to freely choose their supplier.
The EU in the '90s decided to open the energy market to competition step by step. The first one regarded the identification of the competitive and non-competitive parts of such a sector. Whereas the generation and retail and wholesale sectors are competitive, the transmission and distribution ones are not since they are natural monopolies. Thus, these activities needed to be regulated in order to avoid abuses. So, the great operators are regulated in order not to have discrimination regarding the access to the grid.
In order to coordinate member States regulatory authorities and to help achieving a single energy European market, an Agency for the Cooperation of Energy Regulators (ACER) has been put in place.
In 2007 the European countries set the so-called 20-20-20 targets. Within 2020 the EU sets itself the objective to reduce by 20% the EU GHG

emissions compared to 1990 levels, to reach 20% share of EU energy consumption produced from RES and to improve by 20% the EU efficiency. These targets were enacted by the "EU Climate and Energy Package" in 2009, a set of directives and decisions (e.g. Directive 2009/29/EC, Decision 406/2009/EC, Directive 2009/28/EC) that legally bound the Member States to achieve longer term objectives.

However, there is also a political commitment with a longer-term perspective. In fact, EU commits itself and all its Member States to achieve a low-carbon economy by 2050, through targets set 80-95% below 1990 levels. In 2011, the EU Commission adopted the EU "energy Roadmap 2050" where all the most important targets were outlined.

GHG reductions compared to 1990		2005	2030	2050
Power	CO2	-7%	-54 to -68%	-93 to -99%
Industry	CO2	-20%	-34 to -40%	-83 to -87%
Transport (incl. aviation, excl. maritime)	CO2	30%	+20 to -9%	-54 to -67%
Residential and services	CO2	-12%	-37 to -53%	-88 to-91%
Agriculture	Non-CO2	-20%	-36 to -37%	-42 to -49%
Other Non-CO2 emissions	Non-CO2	-30%	-72 to -73%	-70 to -78%

As the table clearly shows, the EU wants to achieve the decarbonisation in all of the main sectors but especially in the "Power" one, which includes the electricity generation sector. The decarbonisation objective implies the electrification of both electricity generation and other sectors. Despite these objectives, the pace and the extent of such electrification are still unclear and uncertain. Given this uncertainty, electrifying the other sectors is necessary in order to reach the objectives set. It is necessary also to be more ambitious for the other sector since the unpredictability is high.

In order to reduce the carbonization of the economy many moves are available:

a. consumption-oriented policies
b. production oriented policies

As for point *a, policies must focus on increasing energy efficiency of electric equipments and transport means* (e.g. household appliances, cars, computers and so on) and, at the same time, on changing consumer behaviours (e.g. switching off all the household appliances in stand-by).

Regarding point *b*, a low carbonization can be reached through low-carbon generation plants such as renewables and nuclear power plants and through the decarbonisation of fossil fuels thanks to the CCS technology.

However, such targets very evanescent. Knowing which technology will be available in the next decades is rather unlikely. Whereas from now to 2020 the technology paths are roughly known and until 2030 they are relatively uncertain, the technology paths of 2040 and 2050 are basically undisclosed. There is a huge uncertainty regarding the 2050 system coming from both internal and external factors (technologies invented out of the EU, global financial crisis, etc.) compared to the 2020.

For such reasons the Energy Roadmap 2050, designed by the EC, outlines different scenarios (diversified technologies + high RES + low nuclear + high energy efficiency). Despite the EU's commitment, the possibility to reach these targets is a matter of States. Only national governments can act to reach the objectives set by the European Union.

As for feasibility, the targets set by the EU 2050 are reachable. There exist various scenarios for Energy Roadmap 2050 which outline different shares to nuclear, fossil/CCS and RES technology but they define as achievable the goals of EU 2050. There exist also other roadmaps which differ in assumptions, baseline and scenarios but all have some aspects in common such as energy efficiency improvements through RES, nuclear and CCS technologies.
The way toward Europe 2050 should be cost-efficient and foster European competitiveness. In order to do so, public intervention is necessary. Public authorities intervene in the energy sector according to four kinds of reasons:

1. Environmental externality: reduction of GHG emissions is a global public good
2. Innovation externalities: spill over effects and related appropriability problem
3. capital market imperfections which can result in a funding gap for small companies
4. increasing global competition which challenges the EU to remain at the forefront of booming international market at a time when Member States reduce public spending

To sum up, policy intervention can be caused by market failures or strategic issues. Regarding the latter, in the wind sector top-European turbine manufacturers see reduction in their global market share, falling from 67% in 2007 to 46% in 2009. Chinese manufacturers gain market shares thanks to a production 30% cheaper than other regions. However, only European manufacturers are active in offshore wind market and that could be and advantage for Europe. Also European solar PV producers face global competition but Europe has still a strong position in solar PV manufacturing equipment which is sold to Asian countries.
Coming back to the policy instruments used by the EU, in 2005 the Union launched the EU Emission Trading Scheme (Directive 2009/28/EC) which was revised in 2009. It works with a cap-and-trade principle with a single (EU-wide) cap. It covers about half of the EU GHG emissions. In 2007 the price of the permits fell to zero as a consequence of too many emission permits. Nowadays, the system works a bit more efficiently, maintaining a low price per tonne of emission but not falling to zero.
Another existing policy is the Renewables Directive which sets mandatory national targets for the overall share of energy from RES in gross final consumption. It is up to the member states deciding how to achieve these targets, which are legally binding. Within today, the approach throughout the EU is very different, proving that there is no policy convergence in a sector where the aim of the Union is to reach only an energy market.
Another instrument is the Strategic Energy Technology Plan which is the technology pillar of the EU's energy and climate policy launched in 2008. It is divided in SETIS, the information System where data and mandatory information are provided to a system hosted by EU and JRC. The Plan has also a European Industrial Initiatives to develop technologies, bringing together industry, academia, Member States and the European Commission. Finally, the plan considers also a European Energy Research Alliance to conduct a joint research among

different sectors to align R&D activities to set plan priorities.

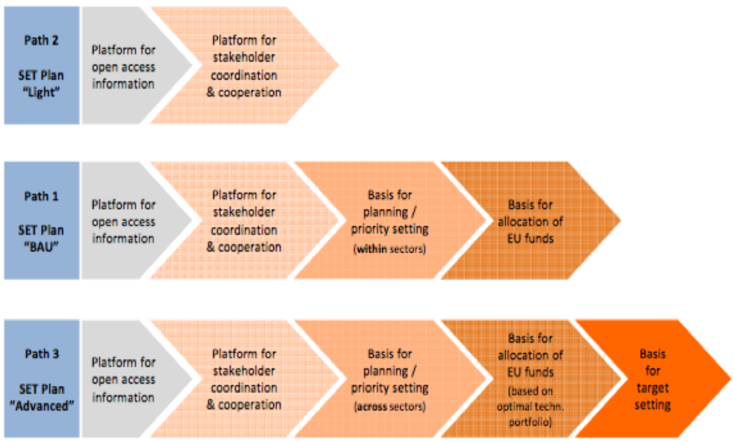
The existing policies that aim and support the developing of low carbon technologies have some lacks which undermine their effectiveness. There exists a lack of one single and adequate carbon price since EU ETS covers only a subset of emissions, prices are too low and too volatile and there exists heterogeneous national approaches regarding non-ETS sectors and RES support policies.

Moreover, EU's Strategic Energy Technology Plan has a limited time horizon (2020 and not 2050) and within-sector approach regarding planning and priority diminishes the impact on the existing policies. Finally, the EU financial crisis and institutional frictions and the increasing global competition delay adequate remedies to address the new context.

Having reviewed the most important aspects of the EU energy technology policy, it is necessary to think where we can go now and in the following years. There are three possible policy paths. Each one can be described using a "toolkit" made by:

1. Market pull instruments
    a. Building on strong price signals and/or
    b. Providing signals through quantitative targets (e.g. setting a certain amount of CO_2 reduction)
2. Technology push instruments
    a. Direct support to innovation
    b. Technology-neutral support to innovation
3. Governance of instruments
    a. Decentralised national actions and/or
    b. Centralised national actions

Path 1 is the continuation of the status quo, market pull, technology push and governance are all hybrid. Path 2 would be based on strong carbon price and technology-neutral support to innovation (path with a strong carbon price). Finally, path 3 would be made by sectoral targets and directed push targeting prioritized technologies. The implications for the Strategic Energy Technology Plan of these three policy paths are described by the picture below.



In order to evaluate these policies it is necessary to assume the achievement of the decarbonisation objective under all policies. Alternative policies can be evaluated based on a set of criteria, i.e. green growth, robustness to EU financial crisis and institutional frictions, cost-efficiency, practicability. According to the policy path, we have different implications for the strategic energy technology plan.

Path 3 is the best solution to support green growth since it has a strong role of directed technology push and the possibility to explicitly support domestic firms. Moreover, path 3 is the most robust to crises since sectorial targets provide stable investment signals and there is the ability to account for different national technology push programs and adjust the burden of decarbonisation among Member States. On the other hand, path 2 is the most cost-efficient solution since it decreases costs across all sectors and abatement channels are minimized. As for path 1, it is the easiest to implement since implementation efforts are low and a subsidiarity compatibility is given.

To conclude, no single policy path is superior to the other, the choice of which policy should be taken may depend on the political priorities and which criteria are used to evaluate these policy options.

Turkey's 21st century energy challenges

Professor Nursin Guney - Yildiz Technical University, Instanbul

Turkey, as all other countries, has to follow its national interest also for energy issues. As a consequence, it is trying to find out a wise energy balance to reach security. Given the nature of energy sector, it is necessary to cooperate with neighbours. So, Turkey needs to cooperate with EU and Russia, the two biggest energy actors in the region.

The European Union has three options to import its needed energy: Russia, Norway, and North Africa. In order to open a fourth option, the EU is looking at two other regions: that is Caspian Sea and Central Asia. It's here that Turkey comes into action.

Turkey, being in the centre of the natural gas supply chain, could be a good player for the EU to diversify energy resources. It could become the gate for the fourth option of supply of natural gas after the above-mentioned regions.

Support for Turkey came from the EU and USA which were pushing for letting Turkey become a player of the European energy diversification. Someone argues that, given the high Turkish demand for energy, Turkey cannot be a viable gate for new energy regions and a new energy actor. That is certainly a starting point of discussion. However, it is necessary to understand that Turkey's position is very precious but it is full of opportunities and threats (e.g. Syria and Iraq turbulence, Iran difficult position, Israeli-Palestinian dispute). The geopolitics of the region is changing rapidly. Turkey has been able to change its relationship with Syria, Iraq and Iran. However, given the actual situation, Turkey has to reshape its foreign policy. With the recent Arab Spring a new actor, which has affected also Turkey's energy policies, came out: the people.

Regarding Turkey's relationships with its neighbours, the most significant in the region is Iran. The relationship between Turkey and Iran is a so-called entangled rivalry, that is both cooperative and conflicting cooperation. Both countries have tried to restrain themselves with the interdependence which takes place between them. But the relationship is difficult also due to the Atlantic Alliance which imposes Turkey to follow NATO politics in the Middle East and the Gulf.

Russia is another important actor in the region from the energy perspective. The cooperation with Russia on nuclear energy is one of the examples which proves the fairly good relationship between the two countries. Despite some critical issues, Moscow has always been accommodating towards Turkey's needs.

The relation between the Northern part of Iraq and Turkey could be a sensitive point for Turkish energy security. Nowadays, the status of this relation is good. There is a wide cooperation between Turkey and Iraq. Turkey is not involved in this region with its state companies but there is the presence of its private companies. Somehow, Turkey hopes to become a transit hub between Iraq and Europe. However, Iraqi situation avoids that such a scenario happens. In addition, a lack of stable and solid relationship between Turkey and Iraq is another obstacle.

Turkey is also committed to decrease its reliance on third party energy natural resources, such as natural gas and oil. It heavily depends on Russia and Iran. Russia is the second trade partner after EU. The 17% of imports from Russia consists of O&G. Turkey wants to decrease the dependency from Russian resources through the increase of its domestic production.

On the other hand, Iran is the other Turkey's partner for energy resources, and the second one for natural gas. Even as for coal, Turkey is still dependent on foreign countries by 90% and there is also a lack in efficiency of coal use.

Another energy opportunity

for Turkey is the Southern gas corridor which should bring natural gas from Russia to Europe. Turkey could be the bridge from Caspian, Central Asia, Middle East areas to Europe. Regarding the Caspian Sea, Turkey is committed to reach a stable situation in order to supply Europe with gas. However, Russia has a big influence on the region and its neighbours.

The Southern gas corridor expects to pass through Baku, Tipis and the Turkish region of Anatolia. This project takes the name of TANAP, Trans Anatolian Project. It has the task to let Turkey become a natural gas gate for Europe through NABUCCO, which is preferred by Turkey since it has some shares in this project. The focus on Southern gas corridor is due to Turkey's need of energy diversification and being pivotal in the region.

However, there are other projects supported by EU that could be different gates to accede to Central Asia natural gas. One of these projects is TAP. Another one could be the ITGI, an interconnector between Italy, Greece, and Turkey which will be finished in 2015. When it will be inaugurated, it is going to supply Europe with Caspian gas.

In the Mediterranean area there's another project which has been put in place: South Stream. It is a project sponsored by Russia and it is a competitor of Southern gas corridor. Turkey gave a green light to South Stream as *do ut des* for TANAP. In that way, Russia didn't oppose to the latter project.

This is the picture of the situation nowadays. Part of the solution for this high dependency on third suppliers could be found in renewable energy sources since Turkey is rich in them . In fact, even though the small share of renewables in Turkish energy production, Ankara is striving to increase its renewable energy production.

On the one hand, Turkey is very ambitious on what concerns renewables; on the other hand, Turkey is trying to achieve a pivotal role in the region as transit country for natural gas. Given its geographical position, between Europe and Asia, Turkey wants to become the energy partner of the region. Finally, Turkey is debating on nuclear power plants in order to ensure a good mix of energy resources and reduce its dependency on external suppliers.

Turkey has already signed two agreements on civil use of nuclear power expected for 2023. The first planned nuclear plant has Russia as partner. This plant is expected to be built in Mersin-Akkyu, Southern Turkey. The second planned plant has the partnership of Japan. Turkey is also planning to have another agreement for a third nuclear plant. As mentioned above, all the projects should be completed in 2023, even though the Russian one should be finished earlier.

Such plans should ensure Turkey to reach a 10% share of nuclear power on the total energy used, whereas renewables should achieve 30%. Despite the building plans for these nuclear power plants, there is a debate on nuclear security since Turkey is subject to frequent earthquakes.

The agreement with Russia is very clear. Russia will build the reactor, provide the fuel and take care of nuclear wastes. By doing so, Turkey avoids doubts on reprocesses the nuclear material for military purposes. Turkey has Russia as partner not only for nuclear energy but also for hydrocarbons. Russia has been very cooperating and generous on oil and gas issues. If this cooperation is very deep, it can also be said that it is binding. As a consequence, Turkey is in need of finding other energy partners.

As for the decision to build a Russian nuclear reactor, It can be argued that Turkey decided to take such a decision and to be provided by Russia with nuclear fuel in order to better understand and improve the knowledge on nuclear technology. So, Turkey has decided to learn from Russia the techniques and technologies to manage a nuclear program by itself.

Finally, it can be argued that, given the crucial changes occurring in the region and the increasing need for energy by Ankara, Turkey is in a period of counterbalance its relationships with the major actors of the region to meet its energy needs.

Changing the game? Industry and Macro Implications of New natural gas supplies

Doctor Douglas S. Meade - Inforum, USA

Natural gas has been underground for thousands of years. Energy experts were informed about the presence of shale gas below the surface but they didn't exploit it. What has been changed? Until few years ago, extracting shale gas was too expensive and not economic viable. With the invention of new extraction techniques, shale gas has become more and more feasible to be extracted and exploited. With the horizontal drilling, hydraulic fracturing and other modern drilling techniques, shale gas has become accessible. Even though, with these drillings, we don't know exactly the cost of shale gas as we don't know how much shale gas is present below the surface. According to some estimates, with the known fields of shale gas, the USA could be energy auto-sufficient for 20 years. However, American O&G firms are keeping discovering additional new fields. These new discoveries have brought somebody to estimate around 200 years supply of gas.

It is not our task to understand whether these projections are true or not, what is important is to understand what the USA are going to do with this gas. People are sure that it is only a matter of time before a big competition on natural gas starts.

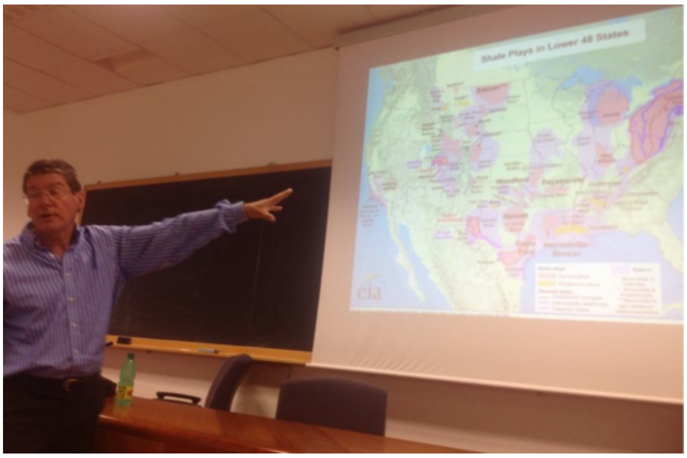
The core areas for shale gas in the US are around North Dakota and Texas. Whereas for oil the big problem is that many fields are present in populated areas or in areas which are particular

important under a natural perspective, for shale gas many fields are located in areas which are cultivated and where GDP is low.

However, in order to make a forecast a methodology must be followed. To develop a good forecast it is necessary to have a very clear idea of all pivotal energy issues and to design alternative scenarios (e.g. high or low demand or supply, business as usual or high/low expectations. In the high supply scenario, gas will cost less than in the low supply one).

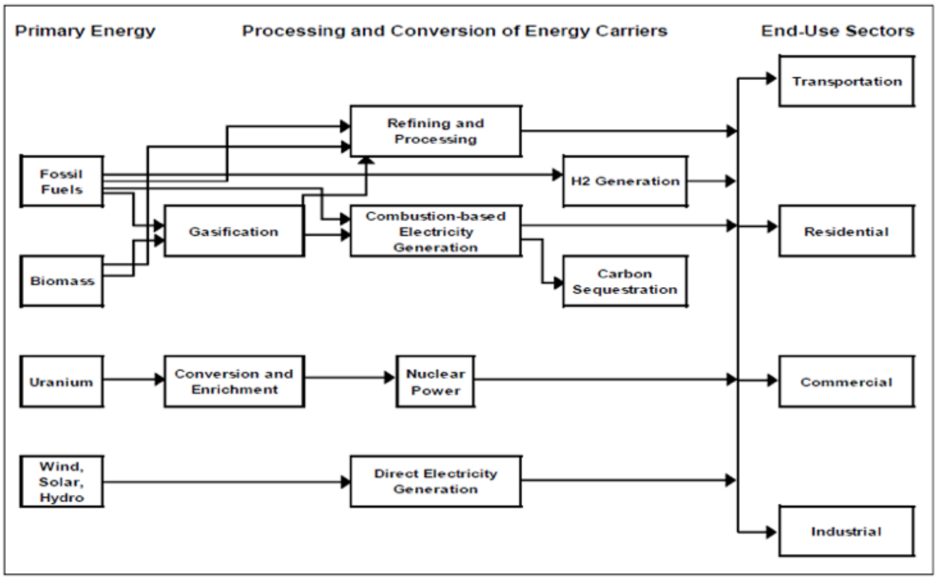
Supposing a supply of a single type of gas is a simplification since different kinds of gas exist. Tight gas is associated with rocks but it's not equal to shale gas as it is not equal to the conventional non-associated gas or the associated gas. Tight gas is an unconventional type of gas which is entrapped by reservoir rocks with low permeability, for example in a

coal mine. On the other hand, shale gas can be found trapped within shale formations. Instead, conventional associated gas is found with oil and non-associated gas is found without any other hydrocarbon.
So, different models, accordingly to model maker's decisions, may include a gas supply made only by conventional gas or by different gases. Other models may take into account gas supply of the entire world, considering all types of gases. Thus, energy modeling tries to take into account different types of models in order to better understand the problem under different perspectives. Other types of models mind to the electric power industry as well. For example, the US electric power sector is going to look at natural gas as game changer, making power cheaper than today. That may deeply affect a model and the following scenario.
Thus, the Energy Modeling Forum (EMF) is an ad-hoc working group, organized to examine a single energy topic, to which many existing models can be applied. EMF 26 seeks to understand the market implications of new natural gas supplies, primarily shale gas. EMF 26 is an industry model which brings together about a dozen models to investigate up to 9 alternative scenarios (reference, high shale supply, low shale supply, high GDP growth, advanced demand, high supply/high GDP growth, carbon constraint, high shale/carbon constraint, and high exports). It takes into account costs, efficiency, investment costs, lifetime, expenses and so on. The models used are the Inforum LIFT and EPA MARKAL model which have been calibrated to have a reference case based on the AEO 2012. LIFT is a large-scale model of the U.S. Economy with input-



output core that builds macroeconomic forecasts from sector level data. Its key parameters (energy prices, energy input-output coefficients that determine the type and amount of energy used in the producing sectors) are taken by Annual Energy Outlook 2012 or MARKAL. Endogenously, LIFT can determine consumer demand for 92 goods and services based on prices and incomes, export and import levels based on relative prices. Economy wide energy use is then derived from consumer demand, government demand, imports, exports, and the interactions between the producing sectors.
On the other hand, MARKAL (MARKet ALlocation) model was developed in the late 1970's by international teams at Brookhaven National Laboratory and Kernforschungsanlage-Juelich and sponsored by DOE and the International Energy Agency (IEA). It models specific energy flows and detailed energy technologies. In addition, it determines lowest cost technology, infrastructure, and energy mix meeting energy service demands (sq. ft. heated, sq. ft. lighted, vehicle miles, etc..). Its output includes technology mix, use of energy carriers,

Figure 1

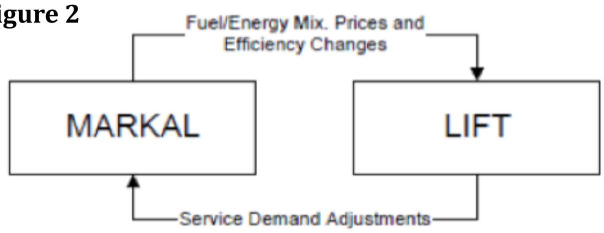


emissions, and estimates of marginal energy prices. For the EMF 26 study, it was used a database developed by the U.S. EPA's Office of Research and Development. the Reference energy system of MARKAL is shown by Figure 1.

MARKAL is initiated with resource supply curves, technology cost and performance, energy service demands, and constraints. MARKAL determines mix of energy carriers (fuels) used and the efficiency with which they are used, for electric power, residential, commercial, industrial and transportation sectors and provides these assumptions to the LIFT model. Instead, LIFT provides MARKAL service demands, based on macroeconomic and industry projections. As a consequence, they are interdependent as shown in Figure 2.

The selected scenarios are different. In the reference case LIFT and MARKAL are calibrated to AEO 2012 Reference, 2.6% annual GDP growth. In the High Shale supply scenario, it is

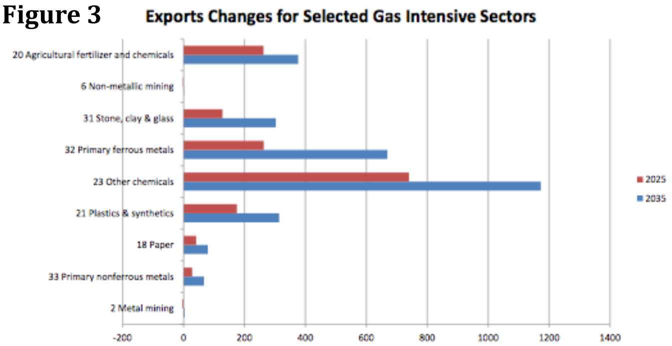
Figure 2



forecasted an higher use of natural gas in all sectors, especially electric power. In the High GDP growth, a faster average GDP growth is assumed around 3.1%, with corresponding increases in energy use and emissions. In the Advanced Demand, a combine high shale supply with increased industrial demand from gas-to-liquids (GTL) and expanded ethylene production is taken into consideration.

Taking into account an high gas supply scenario, we can see what the two models produce as output. The aim of this scenario is to explore the implications of increased gas supply and lower prices, to understand how much exports are stimulated, which sectors may be affected more deeply than other, what the impacts on other sectors' prices are and how much the gas share of electric power generation may increase. The

Figure 3

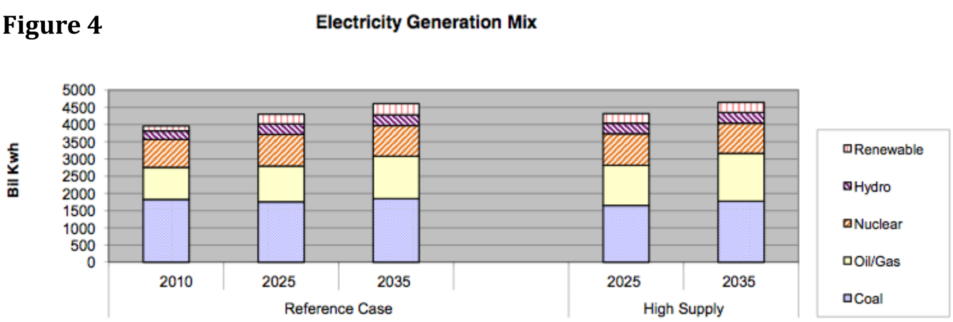


exports changes and outputs for a selected gas intensive sectors are shown in Figure 3.

Between 2025 and 2035, it can be noticed a dramatic increase for categories 23 and 32. Also the stone, clay & glass, agricultural fertilizer chemicals and plastics & synthetics sectors are affected positively in this scenario. On the other hand, also Paper and Primary nonferrous metals experience an increase but not as big as in the previous mentioned categories.

Also the electric power sector is affected by such an increase. As shown in Figure 4, the usage of oil/gas as primary energy source increases between 2010 and 2035 both in the reference case and high supply one. However, in the latter

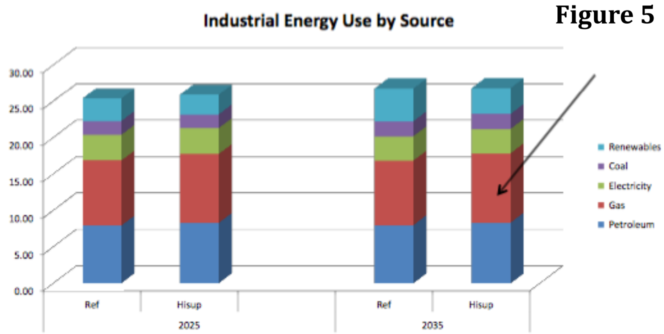
Figure 4



However, in the latter the growth and share of oil/gas usage is bigger, affecting differently the sector.

As proved by Figure 5, also in the Industrial Energy gas usage is more affected by this scenario compared to the reference one, both in 2025 and 2035.

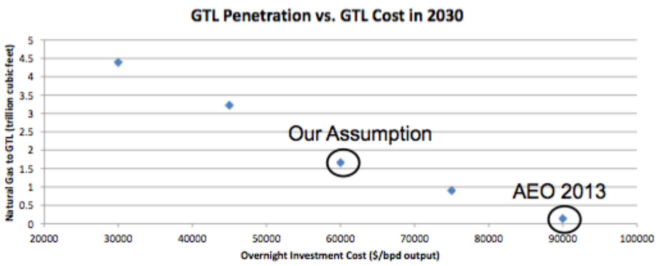
Figure 5



Instead, Advanced Demand Scenario is taken into account in order to explore impacts of more optimistic growth in natural gas demand. It assumes an aggressive penetration of the Gas To Liquids (GTL technology) and supposes 25 percent increase in ethylene production compared to the reference case.

In order to estimate the penetration of GTL technology, the research group used MARKAL to determine sensitivity of GTL penetration to investment cost, assuming gas to liquids as a function of investment

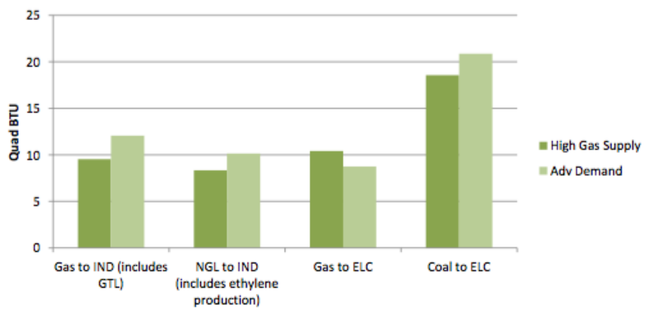
Figure 6



cost. In Figure 6 it is shown the assumption taken into account.

As for the Energy sector dynamics, by 2035 the sum of natural gas and natural gas liquids in this scenario is up 15% over the reference scenario and 7% over the high gas supply one. Comparing the High Gas Supply scenario with the Advanced scenario, GTL drives increase in gas to the industrial sector, ethylene increases natural gas liquids to the industrial sector. A

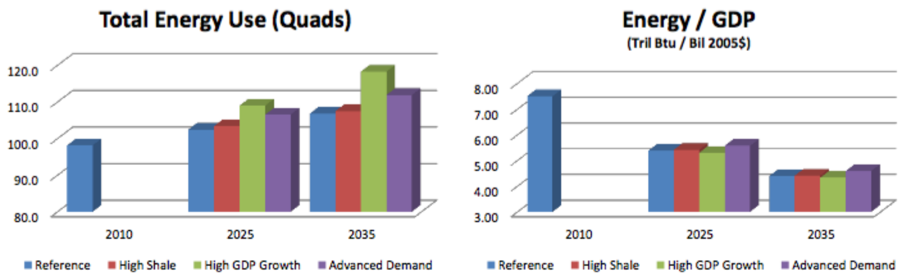
Figure 7



decrease takes place in natural gas within the electric sector (Figure 7). Moreover, 11% of diesel is generated from GTL and the growth of ethylene production takes to an increase of chemical sector exports. Also GDP grows more compared to the High Gas Supply scenario. In addition, the Ethylene production spurs additional manufacturing in the USA, enacting a policy to use GTL outputs to reduce oil imports.

In figure 8 the differences between the different scenarios are presented. High GDP case shows an higher use of energy, advanced demand

Figure 8



scenario forecasts an increased energy use compared to high shale. Whereas, high GDP case shows a reduced energy intensity and advanced demand a greater intensity due to GTL and Ethylene.

As shown above, these models can produce a forecast for product demand and the total demand, how much electricity will be used by the industrial sector, how much consumer goods will be sold. That is justified by the aim of this kind of models. If we need to understand how much energy will be used it is necessary to know all these issues. Another crucial point is where the energy demand is coming. Moreover, for each industry, it is necessary to understand how much f gas is used to produce a certain product. It's important since as gas price goes down, the cost to produce a particular good decreases and becomes cheaper.

Finally, it can be argued that mostly in electric power and industrial sector there exists a higher price response compared to the industrial or commercial sectors. The potential for increased gas use in transportation seems relatively small. Industrial sector response could be larger with favorable GTL technologies and ethylene. The long-run shape of supply curve is not well-known. So, it is not straightforward to understand and know the effect of higher demand on gas prices. In addition to this, export potential remains a big question.

University of Florence students and scholars at the Yildiz University (Instanbul).

Selected students of the University of Florence and Professors Rossella Bardazzi, Maria Grazia Pazienza and Alberto Tonini participated in the conference "Geopolitics of Energy: what the future may bring?" organized by Yildiz Technical University jointly with the University of Florence, held in Istanbul on May 17-18, 2014. Alberto Tonini gave a presentation titled "A half open window: EU energy dependency, Turkey, and the Caspian Region" while Maria Grazia Pazienza and Rossella Bardazzi talked about "Energy mix and energy taxation: A comparison between EU and Turkey".

Exchange Programmes Reports. Experiences of Italian Students

Student mobility to Yildiz University (Turkey).

Ipek Velioglu

This year *Scuola di Scienze Politiche "Cesare Alfieri" of University of Florence* organized an International Student Seminar School with the *Yildiz Technical University Department of Political Science and International Relations*, Istanbul. We, selected students of the Energy, Environment and European Security class, had the chance to attend ten days of classes and seminars about the Energy Security and

Turkey's Foreign Policy.

According to my experience the Energy School was well-organized and well coordinated. We attended two days classes of Turkish professors and experts from different Universities and Institutions. During these classes we enhanced

our knowledge of the key aspects of Turkey's energy mix and her security issues. After developing some basic concepts we visited two think-tanks dealing with energy security. In my opinion these visits were very interesting and helped me to see a wider picture.

The most interesting part of the Energy School was the two days of Conference entitled "*The Geopolitics of Energy: What the Future May Bring?*". It was a unique opportunity to meet different professors and representatives from different countries, USA, Russia, Israel and Azerbaijan, and to discuss with them the role of Turkey in the energy politics.

It was a very nice experience and I suggest my colleagues to attend the Energy School if they desire to deepen their knowledge after having the Energy, Environment and European Security class.

Alessia Mannella

During my experience in Turkey I had the chance to attend the "*International Student Seminar School on Energy Security and Turkey's Foreign Policy*" thanks to the opportunity that University of Florence, in collaboration with Yildiz Technical University, gave me.

The ten days in Istanbul organised by Yildiz Technical University on behalf of Prof. Nursin Guney and her assistants, have been really intensive and interesting. The seminar lessons were attended mainly by professors or Phd Candidates and they took place in the historical palaces of Yildiz University.

Moreover the topic of the conference was well developed and now we have a comprehensive understanding of the main issues on energy security and policy that links Turkey to Europe and Turkish perspective in the future, with a strong focus on gas sector.

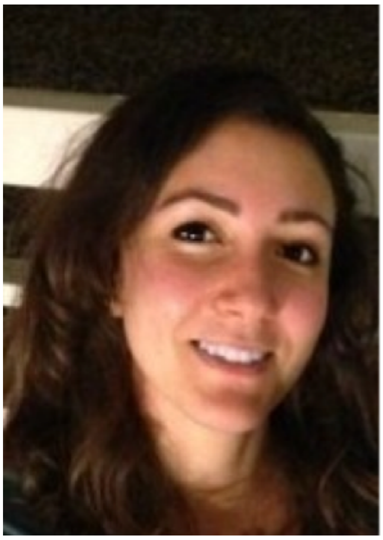
The last two days of conference were organised in a more institutional way, with the collaboration of the Turkish ministry of Energy and a discussion within representatives of Russia, Italy, Israel, Azerbaijan as well as USA, especially on strategic energy issues and policies in the Middle East.

In conclusion it has been a really positive experience, well organised, that I am willing to suggest to everyone at the University of Florence.

Student mobility to Novosibirsk University (Russia).

Amira Badie

After winning the scholarship to undertake researches in Russia, I arrived in Novosibirsk, West Siberia, at the beginning of summer 2014. More than thirty degrees in the sun despite of what our common sense would tell us about Siberia. Both Novosibirsk State University (NSU) and the Institute of Economy of the Siberian Branch of the Russian Academy of Sciences (SBRAS) are situated in Akademgorodok, a scientific site 24 km away of the city.
According to the mobility agreement, I spent more than one week in there, doing my researches under the supervision of Prof. Alexandr Baranov – Doctor of Sciences in Economics, who took care of me, of my arrangements as a guest student and organized meetings with three other professors.
Fist of all Prof. Baranov himself, as an expert of russian macroeconomy, gave me an exhaustive introduction to Russian economy in post Soviet time. This introduction was necessary to make me fully understand the role played by oil and gas industry in the whole economy of the federation.
The second meeting was with Prof. Sergey Kovalev, expert in the oil sector. We discussed together the pros and cons of exploration and development projects in different parts of the Russian territory. He also suggested me several readings and gave me his own perspective, as a scholar, on how the European dependency on Russian fuels is going to evolve in the next future.
The third expert I met was Prof. Vadim Gilmundinov, a quite young researcher whose two major fields of analysis are the environmental problems connected to energy production and consumption and the estimation of Russia's energy consumption rate - that is, modeling volume of internal demand. We discussed together about energy efficiency in Russia and its effect on Russian internal consumption.
After all, internal consumption is something one must consider when tackling with the quantity of energy a country is able and willing to export.



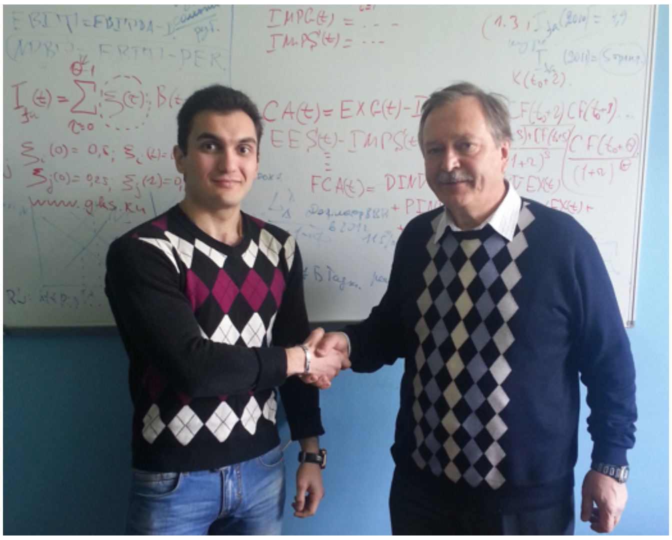
Finally, Prof. Nikita Suslov shared with me the outreach of his team's analysis of the energy sector through use of an inter-regional input-output model. He showed me that this kind of analysis permits to forecast future effects and consequences of different kinds of shocks on energy internal and, what is more interesting for me, external demand.

All the professors that I met were able to make me feel very comfortable and answered to all the questions I asked. Therefore, my general impression about the NSU and SBRAS' staff is definitely a positive one. I would recommend this experience to other students interested in the field.

Maxim Dallakyan

I would like to share with other UniFi students my experience of the apprenticeship in Novosibirsk that I gained after I had passed Energy exam. First, it worth saying that there are

many opportunities of this kind at the UniFi, and all you need is to be better informed in order to catch something really interesting and fruitful for you.
There are some short and important advices here for those who are going to experience this apprenticeship:



1) Try to study some essential Russian vocabulary before your trip. It can help you there both in making new friends and adapting to new society, despite the trip is quite short.

2) Whenever you go there, do not be shy to take warm clothes: it is Siberia, do not forget!

3) Professors Kryukov and Baranov, as well as their staff, are always ready to help you in any possible way. If you need something – just let them know, you will be always welcome.

4) The biggest complexity is that despite the academic district makes part of the city, it is quite distant from Novosibirsk, so you have to

spend at least 1-1.5 hour (if there is no traffic jam in the streets) in public transport in order to arrive in the city center. So, be patient. Anyway, the academic district has all necessary infrastructure as well, and there are many sites to be seen and visited right there.

Of course, if you can speak Russian, you have a very big advantage because of access to broader list of information sources, but also from the daily communication point of view. This was exactly my case.

For two weeks of my apprenticeship in Novosibirsk I have been observing deeply some important topics such as issues linked to the contemporary Russian energy policy, particularly its Siberian (Eastern Russian) aspects, as well as present energy issues in relations between Russia and the EU and Russia and China. In addition, I acquired some basic knowledge about technical and technological points of the oil-and-gas industry and about its current global and Russian trends.
What is important is that at the IEIE you are welcome to make questions, and all the staff does its best in providing any support and helping you to find all the answers needed, sometimes even to quite difficult and multidimensional ones.
Summarizing, I would like to say, that this is absolutely an experience to be done. Do not be afraid of going far away from your native country, especially when your destination looks quite different from your homeland. Finally, I would like to thank our Italian professors and all the persons involved for this great opportunity and all the provided support.

Links

School of Political Science

http://www.sc-politiche.unifi.it/mdswitch.html

International Relation and European Studies

http://www.rise.unifi.it/mdswitch.html

Empowering Europe: Energy, Security and Environment web site.

http://www.eu-ese.unifi.it/mdswitch.html

Jean Monnet Center of Excellence, University of Florence

http://www.unifi.it/vp-4085-centro-di-eccellenza-jean-monnet.html

Other events in Tuscany: Festival of Europe

http://www.festivaldeuropa.eu/en