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Brief

The Future of the European Energy Industry

Lucia de Strasser, Giovanni Occhiali, Simone Tagliapietra

Fondazione Eni Enrico Mattei

Manfred Hafner

Coordinator of the Energy Scenarios and Policy Program at Fondazione Eni Enrico Mattei

Abstract

FEEM Workshop Brief

The European energy system is profoundly changing, on the basis of two main trends: decarbonisation and digitalisation. On the one hand, strong decarbonisation policies have reshaped the European energy system, notably incentivising the deployment of renewable energies. On the other hand, technological advancements have allowed the emergence of new digital technologies that change the way energy systems are operated. In this rapidly changing situation, European energy companies need to rethink their business models, in order to survive - and ideally make the best - of the ongoing energy transition. In order to better understand how these companies can evolve in the future, FEEM 'Energy Scenarios and Policy' program convened on June 14, 2017 in Milan a closed-door brainstorming workshop gathering leading experts in the field from the industry, the academia and the institutions. This Brief provides a reflected summary of this workshop.

01

Introduction

The European energy system is going through a profound transformation, driven by two trends: decarbonisation and digitalisation. Based on strong public policies, decarbonisation is changing the European energy mix, while innovation in digital technologies is enabling disruptive change in the way energy systems are operated. Digitalisation should lead to the European energy system becoming more decentralised, with an increasing interaction of services (electricity, heat, transport, data) that used to be largely separated.

European oil and gas companies are reacting differently to these new challenges and, in several cases, there seems to be a lack of vision about how to adapt to the transformation towards a low-carbon system. European utilities are also struggling to reinvent themselves to make the best of the transition. While some of them are decisively pushing for a shift in their business models from electricity producers to smart-energy services providers, others find more difficult to reshape their traditional business models.

In order to better understand these evolutions, FEEM 'Energy Scenarios and Policy' program convened on June 14, 2017 in Milan a closed-door brainstorming workshop gathering leading experts in the field from the industry, the academia and the institutions.

The workshop represented the third step of the project 'The Future of European Energy', jointly conceptualized and carried-out by FEEM, Bruegel and the Florence School of Regulation. Previous workshops were held in Brussels in June 2016 and in Florence in February 2017. The Brussels workshop focused on the future of the European energy system, while the Florence workshop focused on the regulatory implications of the energy transition.

This Workshop Brief provides a reflected summary of the Milan workshop, with the aim of contributing to the ongoing debate on the future of energy in Europe.

02

The future of European oil and gas companies

Oil and gas companies are the biggest part of the European energy industry by market capitalisation (e.g. around 60 percent, vis-à-vis the 40 percent of utilities) and also represent the sector with traditional business models put most at risk by decarbonisation.

Over the next decades, European demand for oil is projected to decrease in all scenarios, albeit at different rates (e.g. by 26 percent in the IEA Current Policies Scenario between 2014 and 2040, compared to 60 percent in the 450 scenario). Meanwhile, gas demand is projected to grow (in the Current Policies and New Policies Scenarios) or to maintain (in the 450 Scenario) its role. As a result, European oil and gas companies, which in the past enjoyed almost uninterrupted growth in oil and gas demand, will need to transform in all scenarios.

Clear public policy signals are needed to incentivise European oil and gas companies to transform their traditional business models in light of decarbonisation. Without strong policy signals – such as sensible carbon pricing – oil and gas companies are likely to avoid a structural transformation of their business models. In this scenario, oil and gas companies might decide to continue in an almost business-as-usual mode, perhaps just rebalancing their portfolios in favour of gas, on the basis of the expectations of declining demand for oil and prolonged demand for gas.

But European oil and gas companies could also adopt proactive strategies, embracing deep decarbonisation and embark on a transformational process of diversification to new clean energy businesses. In particular, oil and gas companies could accompany their oil-to-gas repositioning with the opening up of new areas of activity on renewable energy. Over the last few years, leading European oil and gas companies have often pledged to commit to new energy solutions. In particular, these pledges were made in the run up to the 2015 Paris climate conference. In that period, almost all European oil and gas companies also created internal ‘New Energy’ divisions. However, with only few exceptions, this momentum has not yet translated into sizeable investments in new energy solutions: a fact that raises a question on whether those moves reflected new industrial strategies or purely communication exercises.

Beyond renewables, oil and gas companies could also invest in another area in order to ensure their future in a deep-decarbonisation scenario: carbon capture and storage (CCS).

CCS is, indeed, a technology that could make a considerable contribution to the decarbonisation of industry (in particular of the production of iron and steel, chemicals and cement) and of fossil fuel-based power generation. According to IEA scenarios, CCS

is critical to achieve the 2-degree target, and becomes even more important in a more ambitious 1.5-degree scenario. Oil and gas companies might play an important role in the development of CCS, particularly considering their technical expertise in terms of operating underground. However, European oil and gas companies do not seem to bet on the future of CCS. In November 2016, ten of the world's largest oil and gas companies pledged to invest \$1 billion over the next 10 years in

climate investments, with a specific focus on CCS. As this represents a very small fraction of these companies' capital expenditure, this pledge casts doubts on the companies' actual commitment to the development of CCS. Raising the level of ambition in this area would certainly represent a good step in the direction of making oil and gas companies more decarbonisation-friendly, to the benefit of their own business and of the overall society.

03 The future of European electricity utilities

European electricity utilities are undergoing a profound transformation, driven by big data, energy efficiency, new electricity storage technologies and smarter grids. Big data is particularly becoming more and more important, given the opportunity it provides to monitor user behavior in real time. Meanwhile, the grid is moving from a traditionally centralized model to an increasingly decentralized dispatching scheme.

In this rapidly changing context, partnering with other sectors and technology developers (e.g. construction, mobility, IT) may be a sensible move for utilities to lead innovation and making the best of the energy transition. Energy markets are changing, and consumers have passed from being passive to be active - if not altogether empowered. Successful new business models thus need to be reinvented, putting prosumers at the centre.

There is no doubt that the real game-changer in the energy system would be the emergence of

revolutionary electricity storage technologies. That's it, once a new generation of batteries will emerge, all the main problems related to renewables (e.g. intermittency and non-dispatchability) will be solved, fostering the electrification of the energy system. Given the crucial importance of this area, electricity utilities might invest more in electricity storage R&D, or partnering with storage developers. This could bring them a considerable competitive advantage to make the best of the energy transformation.

Regulations – notably of electric infrastructure – might be re-designed in order to facilitate the transformation of utilities. The grid is a public good, and its reliability needs to be protected by regulators, meaning that the full integration of renewables should not compromise its security and sustainability. Fitting the increased variability of renewables in the system will require adjusting prices and charges but there are no fixed rules on how to go about this and different countries will likely

respond with different measures. Overall, there seems to be five main points that regulators should keep in mind while designing the rules of the future: i) flexibility should lead to time differentiation in energy prices; ii) network charges should be peak capacity coincident; iii) the locational component of prices and charges should increase; iv) residual network cost should not be distortive; v) tariffs should be built so as to avoid grid defections. Other barriers to be removed are wholesale market

rules biased towards centralised solution, industrial regulations discouraging new players, insufficient regulations of distribution networks. Regulators should not wait too long to tackle these issues, as the potential for transformation of electricity utilities also depend on the regulatory context on which they act. In short, as the energy transition gathers speed, regulators will also need to accelerate in order not to become obstacles to innovation and, ultimately, decarbonisation.

Participants to the FEEM workshop

Daniele Agostini, Head of Low Carbon Policies and Carbon Regulation, Enel

Andrea Bigano, Senior Researcher, FEEM

Carlo Carraro, Director, ICCG/FEEM; Vice Chair, IPCC Working Group III; President Emeritus, Università Ca' Foscari Venezia

Guido Cervigni, IEFE Research Fellow, Bocconi University

Ilaria Conti, Research Associate - Head of Florence School of Regulation Gas

Anne-Sophie Corbeau, Senior Research Fellow, KAPSARC

Luca Cosentino, Executive Vice President, Energy Solutions, Eni

Pierre Cotin, Chief Strategy, Development and Marketing Officer, ELENGY

Lucia de Strasser, Junior Researcher, FEEM

Valeria Di Cosmo, Senior Researcher, FEEM

Ralf Dickel, Senior Visiting Research Fellow, OIES

Vladimir Drebensov, Head of Russia and CIS Economics, BP

Jean Pierre Favennec, Professor, IFP School

Jean-Michel Glachant, Director of the Florence School of Regulation

Tomás Gómez, Director, Institute for Research in Technology, Universidad Pontificia Comillas

Ali Hached, former VP, Sonatrach

Manfred Hafner, 'Energy Scenarios and Policy' Program Coordinator, FEEM

Anthony Hoble, CEO, Carbon Tracker

Ludwig Möhring, Managing Director, Sales, Wingas

Miguel Muñoz Rodríguez, Head of Climate Policies, Iberdrola

Hans Nieman, Senior Vice President, Business Energy Products, Prysmian Group

Øystein Noreng, Professor of Petroleum Economics, BI Norwegian School of Management

Giovanni Occhiali, Junior Researcher, FEEM

Mehmet Oguctu, Chairman, Bosphorus Energy Club

Pippo Ranci, Professor, Florence School of Regulation

Sabina Ratti, Executive Director, FEEM

Giuseppe Sammarco, Senior Vice President, Development operations & Technology, Eni

Andrea Siri, Head of Power Origination, Planning & Origination, Edison

Dario Speranza, Political and Institutional Scenarios and Analysis, Eni

Jonathan Stern, Distinguished Research Fellow, Natural Gas Research Programme, OIES

Simone Tagliapietra, Senior Researcher, FEEM

Markus Venzin, Advisor on strategy and innovation, Prysmian Group

Jean-Arnold Vinois, Honorary Director, European Commission

Laurent Yana, Director, Advisor of Global BU, Group Strategy, ENGIE

Georg Zachmann, Senior Fellow, Bruegel



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Fondazione Eni Enrico Mattei

Corso Magenta 63, Milano – Italia

Tel. +39 02.520.36934

Fax. +39.02.520.36946

E-mail: letter@feem.it

www.feem.it

