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Tomorrow's Energy Prices: An Analysis of System, Actors and Shaping Factors

Jean-Marie Chevalier

If one sector in recent decades has been a byword for how difficult it is to anticipate future developments at the global level, it has been the energy sector. We have seen fears over the dangers of a hydrocarbon shortage, the announcement of "peak oil" and a boom in shale gas and oil. Forecasts based on major trends within the field have been revised as non-conventional sources with a substantial impact on price levels have emerged. Added to this is the need to confront climate change and hence to re-vamp our modes of energy production to give an enhanced role to renewables.

In such a context, as Jean-Marie Chevalier stresses here, it is quite tricky to say how energy prices will develop or how energy production systems will change. This is why, in addition to the overview of possible developments in the prices of oil, natural gas and coal which this article provides, it particularly stresses the many elements of uncertainty that still prevail. Chevalier demonstrates the multiplicity of factors — and actor — involved in the way energy systems and prices develop and highlights the key elements that will play a role in enhancing or curbing those developments in the medium-to-long term.

Energy Forecasts and their Attendant Risks

Rodolphe Greggio and Benoît Mafféi

As Jean-Marie Chevalier stresses in this issue, it is currently quite tricky to pronounce on how energy prices will move over time or to predict how energy production systems will change. Further support for that view comes from this article by Rodolphe Greggio and Benoît Mafféi. They have looked into the way long-term energy forecasts are made and their conclusion is that, as things stand, they are doomed to fail.

The main underlying reason for this is the difficulty of making reliable predictions

about how energy demand will evolve, since it is the product of exogenous developments that are unknowable in the long term (demographic growth, economic growth, productivity, energy efficiency etc.). A number of forecasting errors with regard to technological breaks have also played a role: a "golden age" for natural gas was forecast too early; the date of "peak oil" has shifted around wildly; a peak with regard to ore deposits has not had the impact originally anticipated; and the decline of nuclear power has turned out to require qualification. Ultimately, all this is the product of various political and geopolitical factors linked to the respective energy assets of the different countries and their strategies for achieving energy independence: e.g. the USA and shale gas, France and nuclear power, Germany and renewables. Quite clearly, the current context suggests that a gradual transition from carbon-based to renewable energies is the order of the day, but it is far from easy to predict on precisely what timescale, in what proportions and on what geographical scale this might occur.

Science and Science Fiction, a Volatile Combination

Roland Lehoucq

In issue 413 of July-August 2016, *Futuribles* launched an extended series on the contributions made by science fiction to foresight studies and the relations between the two, in order to discern whether, and to what extent, science-fiction writers have influenced foresight thinking and the collective imagination. After examining these questions from the socio-political and environmental angles, we are resuming this series with a look at science and technology: what have relations been like between science as a discipline and science fiction?

For example, Roland Lehoucq shows how science fiction has run alongside science, enabling what are at times pioneering ideas to be presented from an imaginary angle and to be spun out so that their possible impact on human societies can be explored. Science fiction also has the freedom to

create technical or scientific innovations to meet the needs of a story line, innovations that may turn out to be totally fanciful or may actually become reality (or may, alternatively, have promise but fail in the end to materialize). Lastly, it plays its part in exploring reality and raising essential questions about technical or scientific developments that are ongoing or in the pipeline. In that sense, it represents a genuine arena of experimentation in — and exploration of — future possibilities and their consequences for humanity.

Science Fiction and Innovation

Thomas Michaud

In its July-August 2016 issue (no. 413), *Futuribles* began an extended series on science fiction's relations with, and contribution to, foresight studies, in order to discern whether and to what extent science-fiction writers have had an influence on the collective imagination and on foresight thinking. After examining these questions from the socio-political and environmental angles, we resume this series here, looking now at science and technology: how do science, technology and science fiction relate to one another?

In this article Thomas Michaud looks at the role of science fiction in research and innovation, particularly within public or private R&D centres. Drawing on the specific cases of the European Space Agency, the Nano Regions Alliance (NANORA), Orange Labs, and Intel and Microsoft, he shows how science fiction has fostered — and still fosters — certain forward-looking research projects, and also how it can be used to generate investment or inspire trust among the public to promote specific research or technology. Michaud emphasizes, lastly, how some companies encourage or sponsor science-fiction (SF) writers in order to develop an SF mindset that chimes with their own long-term strategy and the innovations they are working on. So many interactions over which those engaged in foresight studies must cast a critical eye if they are to determine plausible lines of future development.

A Look at the Genesis of Foresight Studies: On Elke Seefried's *Zukünfte. Aufstieg und Krise der Zukunftsforschung 1945-1980*

[*Futures, the Rise and Crisis of Futures Research, 1945-80*]

Corinne Roëls

The history of foresight studies and of thinking on the future has given rise to many books and articles, largely by American and French authors. However, unless we are much mistaken, no one has paid such attention as Elke Seefried to showing how this “non-discipline” was perceived in Germany in the aftermath of World War II. For that reason, this review by Corinne Roëls sheds interesting new light on the question — not least for the controversies to which it may give rise.

Happy Five-Hundredth, Thomas More! (*Future of Yesteryear*)

Nicole Morgan

Last December we celebrated the five-hundredth anniversary of the publication of Thomas More's *Utopia*, which revived a literary tradition begun by Plato — the detailed description of a society that its creator views as ideal. Nicole Morgan, a leading Thomas More specialist, takes a fresh look at this now classic work and its author, a great scholar and statesman, who in it outlines his vision of the optimal form of government as he and his humanist friends of the time saw it. A vision which, in the context of the 16th century, he could serve up only in the form of this humorous narrative that gave us the term “utopia”.

The European Tax Regimes Conundrum: Apple and Ireland as a Prime Example

Jean-François Drevet

In this column, Jean-François Drevet analyses the lessons to be learnt from the European Commission's decision of late August 2016 on Apple's taxation arrangements in Ireland, which required the multinational to pay a fine of 13 billion euros to the Dublin government. On the one hand, he shows that the size of the fine is far from abnormal in terms of fiscal practice in Europe and the USA and, on the other, that the (hostile) reaction of Ireland to the decision says much about the economic and social issues underlying the fiscal practices of EU member states towards major companies. In a context of competition and one-upmanship

around “fiscal attractiveness”, we are getting into situations with regard to tax that are so unequal between European households and companies — and indeed between companies — that they cast doubt on the will of governments to prioritize the

common good. In order to tackle these practices and ensure companies that make profits on European soil pay normal taxes proportionate to those profits, the EU must imperatively commit itself to sorting out taxation across Europe. ■

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