The 2015 Countershock and the Prospects for a Low-carbon Energy Transition

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The Incipient Energy Transition and the Downfall of Oil Prices

For some years now, the need for a transition to a low-carbon economy has been recognized globally as a crucial element of any credible attempt to prevent the expected increase in global temperature from exceeding pre-industrial levels by more than 2° C. As is well known, according to the United Nations International Panel on Climate Change (IPCC) and a large majority of scientists, beyond this threshold, rising temperatures may trigger potentially catastrophic and irreversible effects.[1] At the global level, the Kyoto Protocol of 1997 endorses the objectives of "the enhancement of energy efficiency in relevant sectors of the national econom[ies]" and "research on, and promotion, development and increased use of new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies".[2] These objectives have also been endorsed by most relevant state participants. For example, the United States and China, the two largest economies in the world, issued a joint statement in this regard on 12 November of 2014, stressing their "longer range effort to transition to low-carbon economies".[3] On its part, the European Union has passed legislation to "reduce its greenhouse gas emissions by 20%, increase the share of renewable energy to at least 20% of consumption, and achieve energy savings of 20% or more" by the year 2020.[4]

The timing and feasibility of the transition are contested by the main energy companies and oil-producing countries which continue to expect both an absolute growth of global energy consumption and a dominant role for fossil fuels for decades to come.[5] Nevertheless, many analysts from different backgrounds see bright prospects both for energy saving and efficiency, and for the growth of renewable energy sources in the energy mix: for example, based on the actual reduction of energy use per unit of global GDP in recent years, former ENI Director of Strategy and Development, Leonardo Maugeri, has defined energy efficiency[6] As for renewables, the authoritative IRENA, based in Abu Dhabi, estimates that these could cover 36% of global energy consumption by 2030[7] In any case, between 2005 and 2015, the capacity of wind and photovoltaic power has increased by 9 and 36 times, respectively, surpassing any forecasts made at the beginning of the millennium.[8]

However, commentators have noted that such an incipient energy transition took place during a period of relatively high prices of oil, the raw material that still represents about 30% of world energy consumption and virtually all energy consumption in the transportation sector. Beginning their increase around the year 2000, crude oil prices touched 147 $/b in 2008 and, after a sharp but brief fall in 2009, stabilized around 110 $/b between 2010 and 2014. In the second half of 2014, prices began to fall, down to 47 $/b in January 2015 (followed by a partial recovery up to about 60 $/b in May when we are writing this). In this context, various commentators have expressed the view that, if the regime of low oil prices were to stabilize, the energy transition would be jeopardized by the lack of incentives for energy saving measures and the weakened cost competitiveness of renewable energies.[9]

Oil Prices and the Energy Transition: Theoretical and Empirical Frameworks

That there is a relationship between the trend in crude oil prices and the prospects of sustainable energy solutions is a well established fact.[10] In part, such a relationship is a direct one as far as the transportation sector is concerned. It is easy to surmise, for example, that lower fuel costs can lead individuals to opt for higher consumption, while automakers, shipbuilders and aircraft manufactures could adopt less stringent standards in energy saving measures (including a possible slowdown of the development of electric and hybrid cars). On the other hand, the relationship is also an indirect one, to the extent that natural gas and coal prices generally move in the same direction of those of oil (indeed, gas prices are in part indexed on crude oil prices). While oil now covers only a residual percentage of electric power generation and heating, the fall in oil prices can result in the increased competitiveness of natural gas and coal in these sectors, with negative effects on energy saving in general and with penalizing consequences for the development of wind, thermal solar and photovoltaic power.

The experience of the first countershock in oil prices, in 1986, seems to confirm this pattern – indeed, to a certain extent, it is its archetype. In the second half

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See footnotes at end of text.

of the 1980s, absolute oil consumption began to rise again after a five-year break;[11] energy saving trends slowed down;[12] government subsidies to renewable energy development shrank globally.[13]

In the current framework, it has been estimated that oil prices below 70/80 $/b would disincentivize energy efficiency, while oil prices below 70 $/b would make many investments in renewable energies financially problematic.[14] In short, one should conclude that the energy transition is put at risk by the current fall in oil prices.

However, if this is the theoretical framework, it seems appropriate to reflect also on the dynamics that led to the recent fall in oil prices. Most analysts agree that the 2014 price decrease was the result of several factors: on the demand side, stagnation in Europe and Japan and the slowdown of the growth rates of emerging economies (in particular China); on the supply side, the boom in unconventional oil production from shale oil, tar sands and deep offshore fields. As for the price collapse of the latter part of the year, however, all observers agree that it depended on Saudi Arabia's decision not to play the role of swing producer, and to start a price war instead (against the shale oil industry, against Russia and Iran, or both, depending on interpretations).[15] In short, as has often been the case in the past, today supply and demand interact with the (geo-)political choices of some particularly influential participants on the market. Forecasts on how long the price war could last vary. However, the partly "political" nature of the recent slump seems to rule out the possibility that the price will stabilize around 50 $/b. Both the futures market and many analysts indicate a likely price around 70/80 $/b for the near future, reflecting the notion that the exhaustion of the resource is not imminent, but the trend towards increasing extraction costs is a fact.[16] In short, if the recovery of crude oil prices from their lows in January 2015 were to be consolidated, the room for competitiveness of energy efficiency and renewables should grow in proportion.

Lessons From the 1986 Countershock

Regardless of "how low" (or "how high") the future price of oil will be, there are other elements to be taken into consideration when assessing the prospects of the energy transition, which make the picture less deterministic. Also from this point of view the experience of 1986 seems to provide much food for thought. Indeed, it is undeniable that the countershock in oil prices represented, in that context, an incentive to boost oil – and more generally fossil energy – consumption. And yet, it is useful to note that such a recovery of the fossil paradigm was also the product of a successful political and cultural counteroffensive, which affected deeply the demand side of the equation. Such a counteroffensive was most radical in the United States, the most technologically advanced country, whose economy alone accounted for a quarter of the world economy. Here, during the presidential campaign of 1980, the debate on future energy choices assumed a symbolic character that largely transcended the theme of energy per se: according to Republican candidate Ronald Reagan, who was to come out on top, giving up oil meant in fact to "give in" to OPEC, to increase the perceived vulnerability of the United States, to abjure the principles of the market economy, or even to give up the freedom of movement guaranteed by private cars. In short, the battle to change the country's energy policies, undetaken by president Jimmy Carter a few years earlier, was now depicted successfully as alien to the "American way of life" (although Carter himself had been very keen on presenting it as a quintessentially American endeavour, comparable to the Manhattan Project or the space race). The success of the Reagan counteroffensive manifested itself in the strengthening of the Rapid Deployment Joint Task Force stationed in the proximity of the Persian Gulf, in the drastic cuts to research and development funds on renewable energy and in the virtual abolition of the CAFE standards on fuel consumption. At a more symbolic level, Reagan ordered the removal of the solar panels installed by the Carter administration on the roof of the White House.[17] In the other industrialized countries, the assault was less radical but, as an analyst wrote in 1990, everywhere the prospects of the energy transition clashed with "the general tightening of government budgets and changing national policies in the 1980s".[18]

From this point of view, the interruption of the energy transition that had started in the 1970s can be seen as a consequence of the rise of the "neoliberal" ideas that characterized the 1980s. On the other hand, in a far-sighted analysis dating from 1987, scientists Paolo Degli Espinosa and Enzo Tiezzi observed how the 1970s discussion about the energy future had been timely, but also flawed by the notion, then in vogue, that the oil shocks of 1973 and 1979 indicated the imminent depletion of oil reserves (according to a well-known study of the CIA from the 1970s, this would have occurred as soon as 1985). To the extent that the efforts of the 1970s towards less oil-dependent economies had been built largely on this prophetical premise, they could not remain unscathed when the prophecy went unfulfilled.[19] What seems most relevant here, however, is that the prospects for the development of energy saving measures and renewable energies had already been crippled at the time of the 1986 countershock.

Conclusions

Compared to the 1980s, today the situation seems partially different. Capitalism, especially in its "neoliberal" form, does not appear to be in its heyday and is potentially more vulnerable to criticism. International public opinion seems to be more attentive to the risks of climate change and finally, as noted in the opening of this article, the low-carbon energy transition appears to have been endorsed by many governments and international organizations.[20] In this context, according to IEA Director Maria van der Hoeven, low oil prices could even represent an unexpected opportunity for many countries to introduce a carbon tax to encourage energy conservation.[21]

It must be said, of course, that in many cases the real will of governments to move from words to deeds seems dubious. It also seems appropriate to recall that "green" slogans can be easily hijacked and distorted, both by governments in search of soft power and by private companies in search of visibility on the cheap. In this context, the mobilization of global environmental movements can represent a crucial factor of pressure and control from below, both about the seriousness of the commitments made at the governmental level, and about the speed with which these are turned into consistent policies.

On the road of the low-carbon energy transition there are still many obstacles, both in terms of political will, and in terms of technology and infrastructure (suffice it to think of the problems of the electricity grids, challenged by the passage from a few large suppliers to many decentralized suppliers from photovoltaic plants). If anything, the story of the early 1980s shows that an incipient transition can be stopped and reversed and that a fall in oil prices may be an ingredient of the turnaround. At the same time, the same story also shows that if low oil prices are not necessarily good news on the way for the transition, the factors involved are many and the game remains open.

Footnotes

[1] See the latest IPCC report: IPCC, Climate Change 2014: Synthesis Report (Geneva: IPCC, 2014).

[2] Kyoto Protocol to the United Nations Framework Convention on Climate Change, http://unfccc.int/essential_background/kyoto_protocol/items/1678.php (cited 3 May 2015).

[3] U.S.-China Joint Announcement on Climate Change, 11 November 2014, available at https://www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change.

[4] European Commission, 2020 Energy Strategy, http://ec.europa.eu/energy/en/topics/energy-strategy/2020-energy-strategy. Recently EU institutions have advanced even more ambitious goals: European Commission, Roadmap for moving to a low-carbon economy in 2050, http://ec.europa.eu/clima/policies/roadmap/index_en.htm.

[5] See, for example: ExxonMobil, The Outlook for Energy: A View to 2040 (2015), http://cdn.exxonmobil.com/~/media/global/reports/outlook-for-energy/2015/2015-outlook-for-energy-us-version.pdf ; BP, BP Energy Outlook 2035 (2014), http://www.bp.com/content/dam/bp/pdf/Energy-economics/Energy-Outlook/Energy_Outlook_2035_booklet.pdf; OPEC, World Oil Outlook (2014), http://www.opec.org/opec_web/static_files_project/media/downloads/publications/WOO_2014.pdf.

[6] L. Maugeri, Con tutta l'energia possibile (Milano: Sperling & Kupfner, 2011), pp. 285-299 [Beyond the Age of Oil (Westport: Praeger, 2010)].

[7] IRENA, Rethinking Energy (2014), p. 28, http://www.irena.org/rethinking/IRENA_REthinking_fullreport_2014.pdf#page=20.

[8] G. Silvestrini, Due Gradi (Milano: Ambiente, 2015), p. 101. The Global Wind Energy Council's 2014 report showed wind-generated power to have reached 3.3% of the world's total electricity generation, http://www.gwec.net/wp-content/uploads/2014/04/GWEC-Global-Wind-Report_9-April-2014.pdf. According to the IEA's Technology Roadmap (2014), total global photovoltaic capacity overtook 150 gigawatts in early 2014, http://www.iea.org/publications/freepublications/publication/technology-roadmap-solar-photovoltaic-energy---2014-edition.html.

[9] See for example, Moisés Naim, "The consequences of the consequences", Oil Magazine, March 2015, p. 29.

[10] J. Reboredo, "Is there dependence and systemic risk between oil and renewable energy stock prices?", Energy Economics 48 (March 2015); S. Managi and T. Okimoto, "Does the price of oil interact with clean energy prices in the stock market?", Japan and the World Economy 27 (August 2013), pp. 1-9; I. Henriques and P. Sadorsky, "Oil prices and stock prices of alternative energy companies", Energy Economics 30, no. 3 (2008), pp. 998-1010.

[11] IEA, Key World Energy Statistics (2014), p. 28, http://www.iea.org/publications/freepublications/publication/keyworld2014.pdf.

[12] Maugeri, Con tutta l'energia, pp. 289-291.

[13] See chart and data in M. Laughton, "Introduction", in M. Laughton (ed.), Renewable Energy Sources (London: CRC Press, 1990), p. 17.

[14] Maugeri, Con tutta l'energia, p. 78.

[15] For a broad overview: P. Rimbert, "Pétrole et paranoïa", Le Monde Diplomatique, April 2015, p. 2.

[16] See, for example, the opinion of the president of Husseini Energy Co., Sadad Ibrahim Al-Hussein, as expressed in the interview with John St. Jean, "The Great Unknown", Oil Magazine, March 2015, pp. 19-20.

[17] The same data set cited above, shows that, well before 1986, total IEA governments investments in renewable energies had dropped from their 1980 peak of $1350 million to around $700 million in 1984. See chart and data in Silvestrini and Butera, Il futuro, p. 30. On Reagan: G. Troy, Morning in America (Princeton: Princeton University Press, 2005), pp. 25-30 and 140-143. On Carter: K. Mattson, What the Heck Are You Up to, Mr. President? (New York: Bloomsbury, 2010).

[18] Laughton, "Introduction", p. 17.

[19] Paolo Degli Espinosa and Enzo Tiezzi, I limiti dell'energia (Milano: Garzanti, 1987), p. 22.

[20] See N. Klein, This Changes Everything (New York: Simon & Schuster, 2014).

[21] Maria van der Hoeven, "Use cheap oil to put a price on carbon", 15 December 2014, http://www.energypost.eu/maria-van-der-hoeven-iea-use-cheap-oil-put-price-carbon/. Indeed, in the appropriate tax context, low oil prices could also lead to lower production costs for photovoltaic panels, thus indirectly financing the transition.

IAEE/Affiliate Master Calendar of Events

(Note: All conferences are presented in English unless otherwise noted)

Date	Event, Event Title and Language	Location	Supporting Organization(s)	Contact
2015				
October 25-28	33rd USAEE/IAEE North American Conference *The Dynamic Energy Landscape*	Pittsburgh, PA, USA	3RAEE/USAEE	David Williams *usaee@usaee.org*
2016				
February 14-17	5th IAEE Asian Conference *Meeting Asia's Energy Challenges*	Perth, Australia	OAEE/IAEE	Peter Hartley *hartley@rice.edu*
February 18-19	9th NAEE/IAEE International Conference *Theme to be Announced*	Abuja, Nigeria	NAEE NAEE/IAEE	Adeola Adenikinju *adeolaadenikinju@yahoo.com*
June 19-22	39th IAEE International Conference *Energy: Expectations and Uncertainty Challenges for Analysis, Decisions and Policy*	Bergen, Norway	NAEE	Olvar Bergland *olvar.bergland@umb.no*
August 28-31	1st IAEE Eurasian Conference *Forging Regional Engagement between the East-West Strategic Corridor: Energy, Trade and Transportation*	Baku, Azerbaijan	TRAEE	Gurkan Kumbaroglu *gurkank@boun.edu.tr*
September 21-22	11th BIEE Academic Conference *Theme to be Announced*	Oxford, UK	BIEE	BIEE Administration *conference @biee.org*
October 23-26	34th USAEE/IAEE North American Conference *Implications of North American Energy Self-Sufficiency:*	Tulsa, OK, USA	USAEE	David Williams *usaee@usaee.org*
2017				
June 18-21	40th IAEE International Conference *Meeting the Energy Demands of Emerging Economic Powers: Implications for Energy And Environmental Markets*	Singapore	OAEE/IAEE	Tony Owen *esiado@nus.edu.sg*
September 3-6	15th IAEE European Conference *Heading Towards Sustainability Energy Systems: by Evolution or Revolution?*	Vienna, Austria	AAEE/IAEE	Reinhard Haas *haas@eeg.tuwien.ac.at*
2018				
June 10-13	41st IAEE International Conference *Security of Supply, Sustainability and Affordability: Assessing the Trade-offs Of Energy Policy*	Groningen, The Netherlands	BAEE/IAEE	Machiel Mulder *machiel.mulder@rug.nl*
September 19-21	12th BIEE Academic Conference *Theme to be Announced*	Oxford, UK	BIEE	BIEE Administration *conference @biee.org*