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Transitions in energy history

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Abstract
The paper offers a report of the international conference "Transitions in energy history—State of the art and new perspectives", held in Milan in the winter of 2017 and organised by the Department of documentary, linguistic, philological and geographical sciences of the Sapienza University of Rome, the Leonardo da Vinci National Museum of Science and Technology in Milan, the Fondation EDF, Edison-EDF Group and the Italian section of the World Energy Council. The first part of the paper introduces the overall concept and architecture of the event, exemplifies the different kind of contributions presented at the conference and offers a brief review of the variety of contents and flavours arising from the focus on the category "transition". The second part of the paper focusses instead on some fundamental reflections, also in the light of related conferences promoted by other museums in the international arena.

Keywords Transition · Transformation · Energy production and use · Conference · History · Museum

1 Introduction

The international conference "Transitions in energy history - State of the art and new perspectives", organised by the Department of documentary, linguistic, philological and geographical sciences of Sapienza University of Rome, the Leonardo da Vinci National Museum of Science and Technology in Milan, the Fondation EDF, Edison-EDF Group and the Italian section of the World Energy Council, took place in Milan from 28 November to 1 December 2017 (see Fig. 1).

Without any pretence of exhaustiveness,[1] we will offer here a concise survey of the diverse contents of the event and we will look a little more closely into some fundamental issues, also in the light of related conferences promoted by international museum institutions.

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2 Conception and structure of the initiative

The idea of the conference had taken shape in the context of the activities of the EDF Group's History of electricity and energy Committee, which since 2001 has continued the mission of the *Association pour l'histoire de l'électricité en France* of linking the business world and the academic world. Looking at interlocutors from different fields, the conference availed itself of a composite architecture in terms of promoters and locations. The Museum hosted the historical sessions, which followed an evening open to the general public, while Edison hosted the session on business prospects.

At the heart of the conference was the category of "transition", presently a dominant paradigm that is suitable for the study of historical dynamics as well as the analysis of future perspectives in the energy sector.

The call for papers had addressed transition as a gradual and continuous transformation of the means of production and uses of energy, urging researchers to consider the plurality and the actual characteristics of the transitions traceable in history and emphasising the role of archival sources. The historiographic fertility and plasticity of this interpretative category have been posed as open questions.

[1] The full programme of the conference is available at http://www.museoscienza.org/news/dettaglio.asp?idnotizia=1090, while the publication of the proceedings is scheduled before the end of 2018.

Fig. 1 The poster of the conference

On the business side, transition was seen as a significant change acting in the energy sector due to the policies to combat global warming and the development of innovative technologies.

3 A brief account of historical contributions

The introductory evening explored the energy transitions touching different areas (oil, renewable sources, electricity, gas) and scales (worldwide, European, national, urban) with reference to the second half of the twentieth century.

The keys of interpretation that were identified—first uses of the term and ambiguity of the underlying meanings (Duccio Basosi), energy policies and conflicts of sovereignty (Ilaria Tremolada), flows of money favourable and opposite to changes (Francesca Nemore), evolution of energy supply chains and breakdowns in the urban fabric (Flavio Conia)—made it possible to observe paths and methodologies of historical research showing how nodal factors investigated are crucial in today's context as well.

At the opening of the conference, Giovanni Paoloni, its scientific director, looked at the history of energy as an area of interdisciplinary interest to analyse the relationship between development and transformation of the territories. Alain Beltran, president of the Committee, focussed on history as a study of change. The awareness that every period is a period of transition leads us to investigate modes, times and reasons, to the point of deconstructing the idea of transition as a mere substitution or a necessarily completed process.

Over twenty historical contributions explored a wide chronological period, through the nineteenth and twentieth centuries up to recent years, with case studies concerning Europe, especially Western Europe, and the Americas. The focus on the concept of transition opened the horizon to both contributions of a theoretical character and those involving specific cases.

Among the contributions of the first type was that of Joseph Szarka, who reflected on the ambivalence of the expression "energy transition", which can refer either to a gradual, multifactorial and cumulative process or to an epochal revolution, and proposed an analysis based on different requisites, among which: a focus of the transition on processes or products, large or limited scale, spontaneity or prescription of change, open horizon or deterministic development, short or long time frame.

Among the contributions of the second type was that of Jean Pierre Williot, who analysed the French gas sector, identifying three historical phases, associated with manufactured gas, methane and biomethane, with composite and complex breaks, where what changes is the whole technological structure of the supply chains, the infrastructuring of the territories, the users and the uses, and the business communication. Every form of energy produces its own transitions, which are part of a large scale change.

Other speakers combined case studies and methodological issues, posing open questions. Among these, John L. Bush presented the transition from sail- to steam-powered naval propulsion in the nineteenth century. This was a changing transition, depending on the chosen perspective: revolutionary, since it allowed, for the first time in history, control of positions and times for practical purposes; very slow, since decades passed before steam was considered reliable for navigation in the open sea and became the standard; and perhaps susceptible to being overturned later, for reasons of sustainability, by new sail-engine coexistences.

Independent of the distinction made so far, some contributions proved to be very suggestive. Charles-François Mathis described a Victorian society where coal was a divine gift and the ineluctable destiny of the English nation both in its abundance and scarcity; where the power of steam was predestination and reason for existence; where the anxiety about the depletion of coal resources and the responsibility towards posterity led to rationalising production and consumption rather than favouring the transition to other sources.

Duccio Basosi investigated the uses and ambiguities of the phrase "energy transition" in official statements, in scientific publications and in the press in the 1970s and 1980s worldwide. His analysis shows that renewable sources were not the core of a clear and unequivocal energy transition project but an element of a diverse mix, with a view at marginalising OPEC oil more than oil itself, between misunderstandings about the depletion of resources and faulty predictions on price trends.

Mathieu Arnoux probed the finalistic pitfalls hidden in some more and less standard interpretive frameworks, showing the shadow cast retrospectively on ancient energy systems, based on renewable sources, by the choice of evaluating them as (pre-industrial) structures that were variously able to evolve to (industrial) systems based on fossil fuels.

There was no lack of interesting comparisons: the transition to nuclear power as a perhaps successful process in France (Yves Bouvier) but a failed one in the United States (Robert Lifset); the role of energy in the agendas and techno-political utopias of the Greek junta (Stathis Arapostathis and Yiannis Foutopoulos) and the Albanian state economy (Rovena Sakja); the rapid shift from renewable sources to fossil fuels in post-WWII Finland (Timo Myllyntaus) and the lasting legacy of the past hampering the transition to renewable sources in Central-Eastern Europe (Matúš Mišík).

Finally, there was much food for thought between past and future: the interdependence of the energy and industrial systems; the shaping action of funding on the European Union's energy system; the reduction of energy consumption

as a new resource; the key role of the use of electricity; the ethical aspects of energy transitions; the studies of the energy scenario and the storage of the computer data.

4 Reflections from a museum viewpoint

The participation of the Museum in this initiative made it possible to open a window for the general public onto the proceedings of the conference. Having already discussed the format chosen for the conference, it is perhaps worthwhile to cover more generally the synergies between historical and museum work. First of all, it must be noted that these synergies, although desirable, cannot be taken for granted.

The evolutionary trajectory of museums, increasingly subscribing to interactivity, the tastes of the general public, more and more accustomed to a performative dimension, and the growing requests by public and private stakeholders for museums to be productive, produce a short circuit that makes it difficult to value and perceive museums as historical systems. This is even truer in technical-scientific museums, dedicated to expounding researches and enterprises living in a perennial snapshot of the present and seeing themselves projected into the future. Yet the Institution does not give up the idea of offering to the public its essential role as living memory and invites the community of historians to look at Museum for teaching, research and possibly militancy.

Certainly the exchange with historians is important in making the most of the patrimony: an articulated system of archival and library funds, art collections, instruments and machines, ever richer in technical-scientific assets after the second world war, which show the charm, the tensions, the contradictions, the different needs, and the unequal power relations between the donor and the donee, all typical of contemporaneity.

Thus, the Museum, in a perspective perhaps not different from the rest of society, also asks historians to connect threads with the present, without forcing but recognising a programmatic value to this course.

The conference in Milan went in this direction. If we look at similar conferences ("Transition in energy landscape and everyday life in Nineteenth and Twentieth Centuries"; "How new are the renewables? Historicizing Energy Transitions") organised last year by such institutions as the Deutsches Museum and the Rachel Carson Center, we notice however a closer relationship in the planning phase between museum and research, which produced different calibrations: in the lexicon, related to the tropes of the museum setting (landscape, everyday life...); in the focussing of the period and the environment under scrutiny; in the sessions, less dense, more oriented to discussion and with a clearer common theme; in the range of disciplines involved.

This is not surprising. Those events are the result of the great German investment in a joint research programme between natural sciences and humanistic studies that fully involves museums.

The Leonardo da Vinci National Museum of Science and Technology, inspired from its beginning by a unitary vision of culture and attentive to the trends of the international museology, has for some years been developing initiatives within a wide range of knowledge, also testing the difficulties involved in the construction of a common horizon.

In this perspective, the experience of the conference invites us to a further synergic effort: to favour the osmosis between neighbouring sectors, such as the history of energy and that of environment or with areas such as anthropology; to promote investigations on the premises and the developments of sectors that are relevant today, such as the regulatory one, often referred to in the business session but absent from historical ones; to allocate collective energies to meta-level work that distils an essence from the multiplicity of examples.

And if the Museum can reciprocate the necessary effort, it is perhaps with its ability to inspire that is its very foundation, by relentlessly attracting itself and all the scholars to that anthology, born of the complexity of the world, that are its collections, its stories and the visitors who arrive every day, and by creating opportunities to work on what is complex with a desire for integrated frameworks, where knowledge and, before that, epistemologies and values are interwoven.

5 Further reading

On energy as a period-defining factor, see [3].

On the evolutionary trajectory of museums, see [4].

On historical research in interdisciplinary dialogue, on the understanding of the present through the past and on the pitfalls in the retrospective use of interpretative categories, see [1, 2].

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