MILESECURE-2050 MANUSCRIPT

Working Title: Low-carbon Energy Security from a European Perspective

Publisher: ELSEVIER

Status: forthcoming

Tentative publication date: Janauary 2016

Authors/Reviewers:

Patrizia Lombardi (POLITO); Max Grünig (ECOLOGIC); Andreas Prahl (ECOLOGIC); Katherine Weingartner (ECOLOGIC); Giancarlo Cotella (POLITO); Silvia Crivello (POLITO); Marat Karatayev (POLITO); Govert Valkenburg (MUSTS); Sergio Giaccaria (JRC); Tilemahos.EFTHIMIADIS (JRC); Bruna Felici (ENEA); Bruno Baldissara (ENEA); Oscar Amerighi (ENEA); Francesco Gracceva (ENEA); Christophe Cassen (SMASH); Céline Guivarch (SMASH); Giovanni Caiati (LSC); Gabriele Quinti (LSC)

TABLE OF CONTENTS

The chapter aims at picturing the future energy geopolitics of Europe, to be read within the broader energy world order. To do so, it starts from a discussion of the main storylines that characterise the international debate concerning energy security (i.e. the global energy consumption growth, the depletion of energy resources, the role of energy technology etc.), to then move to explore the potential futures ofenergy world order. More in details, the role played by oil and natural gas and the geopolitical relations caused by the latter will be explored, together with the regions playing a key role in current geopolitical energy situation (i.e. the Persian Gulf, the Caspian Sea, Africa).

III. Reshaping equilibria: renewable energy mega-projects and distributed generation

(Grünig and Prahl)

Brief introduction to case study methodology, key insights

5. Tapping the desert for sustainable power: Morocco and North Africa
    a. DESERTEC and Noor project backgrounds (Quinti and Caiati)
    b. Moroccan energy policies and support mechanisms
    c. Energy security implications
    d. Fostering new scalar and spatial geopolitical alliances
6. The winds of the North Sea (Grünig and Prahl)
    e. North Seas Offshore Grid and Kriegers Flak project backgrounds
    f. Energy policies and support mechanisms around the North and Baltic Seas
    g. Energy security implications
    h. Fostering new scalar and spatial geopolitical alliances
7. European distributed renewable energy case studies (Quinti and Caiati)
    i. Anticipatory experiences reflecting how do we envisage in the long-term that renewable energy will compete with fossil fuels in a liberalised market environment (Caiati)
    j. The German experience of the Energiewende (Grünig and Prahl)
        i. energy policies and support mechanisms
        ii. energy costs for retail and wholesale
        iii. energy security implications
        iv. acceptance and social implications
    k. The Italian experience with renewable energy (Quinti and Caiati) (Bruna Felici, Bruno Baldissara and Oscar Amerighi)
        i. energy policies and support mechanisms
        ii. energy costs for retail and wholesale
        iii. energy security implications
        iv. acceptance and social implications

    (OPTIONAL additional chapter on Spain)

l. lessons learned in Europe during the last decade regarding climate change mitigation, costs and energy security, and how to balance that with competitiveness concerns in Europe (Gruenig)

IV. Developing policy strategies towards a low-carbon and secure energy system

(Gracceva)

8. Energy security in low carbon pathways (Christophe Cassen (SMASH/CIRED), Francesco Gracceva (ENEA)
    a. Evaluating the co-benefits of climate policies on energy security challenges
    b. Climate policies and energy security: two sides of the same coin?
9. Towards governance of energy security and climate change mitigation (MUSTS - Govert Valkenburg and ENEA - Francesco Gracceva)
    a. Governance framework of complex problems
        i. Conceptual diagnosis of complex problems / wicked problems (Conklin, 2005; Hoppe, 2002)
        ii. Literature review on policy strategies towards complex problems
            1. Social learning (Reed et al., 2010),
            2. Knowledge production for complex problems, literature such as (Bijker et al., 2009; Funtowicz, 2002; Funtowicz & Ravetz, 1993; Hegger, Lamers, Van Zeijl-Rozema, & Dieperink, 2012; Nowotny et al., 2001)
            3. How such knowledge can speak saliently to policy making. *Prepare here that quantitative indicators are typically a powerful way to speak to policy making!*
    b. The role of governance in granting the coherence between security and climate policies
    c. How a systemic view on ES and CCMA can help moving beyond a mere tradeoff between them?
    d. Round-up: the systemic approach, with its internal richness, allows for a more substantive recommendations on how the 'extended peer community' in heterogeneous knowledge production is to be shaped; as well as for a more substantive idea of how such knowledge can speak saliently to policy
10. Reducing uncertainty through a systemic risk-management approach
    a. Energy security in a low-carbon pathway. Literature review from different perspectives Problems of energy security (ES) and climate change mitigation and adaptation (CCMA) are tightly knit together and thus form complex problems
    b. Yet, they are typically addressed through simplistic approaches based on indicators
    c. This typically leads to the conclusion of the existence of a double dividend, sometimes of a trade-off or zero-sum relation
    d. Critically assess the problematic of oversimplification:
    Articulate the (normative) presumptions that underlie the construction of indicators (Rametsteiner et al., 2011)

e. An alternative framework to move along the axis of knowledge, i.e. to reduce the degree of factual disagreement
    i. Energy security as a system property of the energy supply chain [Expand from (Gracceva & Zeniewski, 2014)]
    ii. Systemic risk management approach, in coherence with C(2013) 7243 final (see appendix)
    iii. Based on ideas of governance of wicked / complex problems
    iv. Show how the new framework addresses (from a complex-problems-policy-perspective!):
        1. New challenges for system stability
        2. New challenges for system flexibility
        3. New challenges for system resilience
        4. New challenges for system and market adequacy
        5. New challenges for system robustness

V. Discussion and Conclusions

(Lombardi and Grünig)

11. Challenges and opportunities, tensions and priorities
    m. Revisiting key themes:
        i. Centralised vs. decentralised generation
        ii. Societal priorities: from energy security to energy responsibility
        iii. Low-carbon energy security – from potential to possible
    n. Concluding thoughts and further research needs