

# Energy security and climate change.

Riccardo Rosselli - MSc GECP, SOAS, University of London

The energy security discourse has been traditionally dominated by the national concern of securing enough oil supply, while, at the same time, avoiding dependence on a single provider (Kruyt, et al., 2009). The concept, though, has evolved through time, and nowadays it has started to encompass new concerns over the climate impacts associated with prolonged and growing greenhouse gas (GHG) emissions. If the role that energy plays in affecting climate change is clear and well understood (IPCC a, 2014), the reciprocal impacts of climate change on global energy security general, and on energy production, transportation and consumption in particular, have only recently begun to be addressed (Klare, 2015). Most importantly, climate change does not hold a substantial position in national energy agendas and it is not yet part of an integrated approach to energy security, as the latter is still determined by national priorities.

Since the early years of the 20<sup>th</sup> century, energy security became a critical aspect of national security and policy making (Symons, 2012). Through time, developed nations became increasingly dependent on cheap oil from new independent nations (Cherp & Jewell, 2011) for military, transport, manufacturing, electricity generation and so on. The fragility of this system became apparent when numerous Arab countries cut oil exports in 1973, triggering a severe economic crisis and threatening the security of several. These events led to the development of a new global energy security framework based on three different elements: a new international organisation – the International Energy Agency (IEA) – created to coordinate an emergency response from OECD countries in case of sudden disruption of supply from producing nations, a new US foreign policy projecting its military and political power to oil exporting countries in order to secure ‘the free movement of Middle East oil’ (Klare, 2006) and the creation of a global oil market to reduce the monopoly of the Gulf countries (Yergin, 2011).

Although the sovereignty and military dimensions of securing supplies are still fundamental aspects (Bochkarev & Austin, 2007) (Yergin, 2011), the concept has expanded materially (to other

resources, primarily natural gas, and to new energy-thirsty countries, i.e. China, India) and conceptually, developing in fields other than geopolitics (Cherp & Jewell, 2011). The increasing technical complexity, and therefore vulnerability, of energy systems have generated the need for a scientific and engineering thinking and dimension of energy security (Cherp & Jewell, 2011) (Farrell, et al., 2004) while the creation of a global market fostered by the US and the conceptualisation of energy as a market commodity has raised the relevance of an economic one. Therefore, the notions of preserving 'affordable prices' to secure 'economic welfare' are now embedded in the current definitions of energy security: the adequate, reliable and affordable supply of energy to support the functioning of the economy (Saddler, 2012) (Yergin, 2006). Finally, the need to decarbonise our energy systems have created the environmental dimension (Alhajji, 2007) (Sovacool & Brown, 2010) (von Hippel, et al., 2011).

Each dimension (energy supply, economic and environmental) is constantly in a state of tension commonly called the 'energy trilemma', or, in other words, the conflicting goals that governments face in securing affordable and sustainable energy supplies (WEC, 2011). The key challenge is the concern about the potentially negative impacts on one or more of the trilemma dimensions while pursuing the others. For instance, a focus on reducing GHG emissions upscaling power generation from renewables may impede affordable energy access, while a focus on increasing access to modern energy through the implementation of cheap fossil fuels may impact environmental sustainability (WEC a, 2015). The energy trilemma, however, will unfold differently in different countries and contexts. And as the effects of climate change impact national energy systems differently (Gunningham, 2013), as national energy security policies vary between states in relation to their specific conditions (Christoff, 2012). Consequently, even if climate change has conceptually entered the notion of energy security, it does not mean that energy security is fundamentally about climate change.

Indonesia represents a good example of a country favouring the economic and security sides of the trilemma over the environmental one. It is the world's fourth most populated country, south-east Asia's largest economy, and one of the fastest growing economies in the world (WB, 2016). The

country is also extremely rich in terms of energy resources: it hosts one of the world's biggest coal as well as considerable quantities of gas and oil, on which Indonesia has substantially relied to fuel its power plants. However, the high population and economic growth rates have steadily inflated national energy demand, forcing the government to import large quantities of oil and worsening the energy security profile of the country (Gunningham, 2013). Additionally, only 35% of the population has access to electricity, while the government has set a target for 2025 to connect 95% of all households to the grid (IEA, 2011). Indonesia has tackled these issues by expanding its coal-based electricity capacity, disregarding the environmental consequences, as this resource could facilitate the increase in energy demand and at an acceptable price in terms of fuel, technology and infrastructural costs (AERC, 2007).

On the contrary, there are some synergies between the elements of the energy trilemma. The European Union represent a good example in this sense. Virtually 100% of the entire region has access to electricity, while the concerns about climate change and energy security, especially for what concerns natural gas, are high on the agenda. Yet, in 2008 the EU has taken a path in which diversification of energy resources, which includes the expansion of renewables, a successfully contained energy consumption growth, and investments in energy efficiency, forms an integrated policy effectively tackling GHG emissions and energy security issues at the same time (WEC b, 2015).

In conclusion, energy security is still understood as a goal of national policy making (Yergin, 2006). Countries typically pursue their own energy policies which will consequently find different balancing solutions to their specific energy trilemma. Even though in the 21<sup>st</sup> century the concept of energy security is extremely more comprehensive than the original one, and new attention has been given to climate change even within energy security organisation such as the IEA, we see discrepancies between climate policies needed and advanced globally and the energy policies implemented nationally.

## Bibliography

- AERC, 2007. *A Quest for Energy Security in the 21st Century: Resources and Constraints*, s.l.: Asian Pacific Energy Research Centre.
- Alhajji, A., 2007. What is Energy Security. *Middle East Economic Survey*, Volume 52.
- Biol, F., 2012. Energy and Climate Change: Looking at Future Trends and Risks. In: *Future Risk: CLimate Change and Energy Security- Global Challenges and Implications*. London: The Chartered Insurance Insitute, pp. 11-18.
- Bochkarev, D. & Austin, G., 2007. *Energy Sovereignty and Security*, s.l.: EastWest Institute.
- Bohi, D. & Toman, M., 1996. *The Economics od Energy Security*. Norwell: Kluwer Academic Publisher.
- Checchi, A., Behrens, A. & Egenhofer, C., 2009. *Long-Term Energy Security Risks for Europe: A Sector Specific Approach.*, s.l.: CEPS.
- Cherp, A. & Jewell, J., 2010. Measuring Energy Security: from Universal Indicators to contextualised Frameworks. In: B. Sovacool, ed. *The Routledge Handbook to Energy Security*. s.l.:Routledge.
- Cherp, A. & Jewell, J., 2011. The three perspectives on energy security: intellectual history, disciplinary roots and the potential for integrations. *Current Opinion in Environmental Sustainability*, Volume 3, pp. 1-11.
- Christoff, P., 2012. Energy Security and Climate Change-Tensions and Synergies. In: L. Aneschi & J. Symons, eds. *Energy Security in the Era of Climate Chage*. s.l.:Palgrave Macmillan.
- DoE, 2013. *U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather*, Washington D.C.: U.S. Department of Energy;.
- DoE, 2014. *Effect of Sea Level Rise on Energy Infrastructure in Four Major Metropolitan Areas*, Washington DC: U.S. Department of Energy.
- EC, 2010. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, Bruxelles: s.n.
- EIA, 2013. *International Energy Outlook 2013*, Washngton DC: EIA.
- EIA, 2014. *International Energy Outlook 2014*, Washington D.C.: EIA.
- Farrell, A., Zerriffi, H. & H., D., 2004. Energy Infrastructure and Security. *Annual Review of Environment and Resources*, Volume 29, pp. 421-469.
- Gunningham, N., 2013. Managing the Energy Trilemma: the Case of Indonesia. *Energy Policy*, Volume 54, pp. 184-193.
- Hartley, P. & Medlock, K., 2008. *Climate Policy and Energy Security: two sides of the same coin?*. s.l.:J.A. Baker Institute for Public Policy, Rice University.
- IEA, 2011. *World Energy Outlook: Energy for All: Financing Access for the Poor, Speacil Early Excerpt of the World Energy Outlook*, s.l.: IEA.

IEA, 2012. *World Energy Outlook 2012*, Paris: IEA.

IEA, 2016. *Energy Security*. [Online]

Available at: <http://www.iea.org/topics/energysecurity/subtopics/whatisenergysecurity/>  
[Accessed 27 February 2016].

IPCC a, 2014. *Climate Change 2014: Synthesis Report: Summary for Policymakers*, Geneva: IPCC.

IPCC b, 2014. *Climate Change 2014: Impact, Adaptation and Vulnerability*, Geneva: IPCC.

IPCC c, 2014. *Climate Change 2014: Synthesis Report, 12*, Geneva: IPCC.

Jotzo, I., Resosudarmo, D. & Nurdianto, A., 2009. *Climate Change and Development in Eastern Indonesia*, Singapore: Institute of Southeast Asian Studies.

Keppler, J., 2007. *International Relations and Security of Energy Supplies: Risks to Continuity and GEopolitical Risks*, Paris: University of Paris-Dauphine.

Klare, M., 2006. Oil, Iraq, and the American Foreign Policy. *International Journal*, Volume 62.

Klare, M., 2015. Climate Change Blowback: the Threats to Energy Security. *SAIS Review of International Affairs*, 35(1), pp. 61-72.

Kruyt, B., van Vuuren, D., de Vries, H. & Groenenberg, H., 2009. Indicators of Energy Security. *Energy Policy*, Volume 37, pp. 2166-2181.

Loschel, A., Moslener, U. & Rubbelke, D., 2010. Indicators of energy security in industrialised countries. *Energy Policy*, 38(4), pp. 1665-1671.

Mayer, M. & Schouten, P., 2012. Energy Security and Climate Security under Conditions of the Anthropocene. In: L. Anceschi & J. Symons, eds. *Energy Security in the Era of Climate Change*. s.l.:Palgrave Macmillan.

Saddler, H., 2012. National Energy Security in a World Where Use of Fossil Fuels is Constrained. In: L. Anceschi & S. J., eds. *Energy Security in the Era of Climate Change*. s.l.: Palgrave Macmillan.

Sovacool, B. & Brown, M., 2010. Competing Dimensions of Energy Security: and International Perspective. *Annual Review of Environment and Resources*, Volume 35, pp. 77-108.

Symons, J., 2012. Introduction: Challenges to Energy Security in the Era of Climate Change. In: L. Anceschi & J. Symons, eds. *Challenges to Energy Security in the Era of Climate Change*. s.l.:Palgrave Macmillan.

von Hippel, D. et al., 2011. Energy Security and Sustainability in North East Asia. *Energy Policy*, 39(11).

WB, 2016. *The World Bank. Country profile-Indonesia*. [Online]

Available at: <http://www.worldbank.org/en/country/indonesia/overview>  
[Accessed 03 March 2016].

WEC a, 2015. *World Energy Trilemma*, London: World Energy Council.

WEC b, 2015. *2015 Energy Trilemma Index*, London: World Energy Council.

WEC, 2011. *World Energy Council*. [Online]

Available at: <https://www.worldenergy.org/work-programme/strategic-insight/assessment-of-energy-climate-change-policy/>

[Accessed 3 March 2016].

Werrell, C. & Femia, F., 2015. Climate Change as Threat Multiplier: Understanding the Broader Nature of the Risk. *The Center for Climate and Security*, Volume 25.

Yergin, D., 2006. Ensuring Energy Security. *Foreign Affairs*, 85(2).

Yergin, D., 2011. *The Quest*. s.l.:Penguin Group (USA) Incorporated.