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THE TIMES THEY ARE A-CHANGIN': POSITIVE AND NEGATIVE IMPACTS OF LOW-EMISSION TRANSITIONS IN LIVESTOCK FARMING, THE ENERGY SECTOR, AND CITIES

At a glance

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Summary An overview of TRANSrisk case studies in the Netherlands, Kenya and Chile, and their relevance to the production of Nationally Determined Contributions (NDCs).



Commentaries

The Paris Agreement of 2015 has thus far resulted in the submission of over 110 Nationally Determined Contributions (NDCs). NDCs stipulate a certain greenhouse gas (GHG) emissions reduction objective, and the way in which this can be met. For realising the NDCs, countries and sectors will have to make transitions in order to realise their sustainable development goals with low emissions. In order to improve our understanding of the impacts, risks, and uncertainties of such transitions, the TRANSrisk consortium hosted a side-event at the EU Pavilion at COP22 in Marrakesh, on 18 November.

Preliminary results of three TRANSrisk low-emission transition case studies were presented:

- Pathways for reducing emissions from livestock farming in the Netherlands;
- The role of renewable energy and biomass in Kenya's low-emission transition; and
- Linking reductions of GHG emissions and air pollution in Santiago de Chile.

A low-emission transition refers to technologies and/or practices applied in a certain region or country to reduce its impacts on climate change. Transitions do not refer to a single project or installation, but to large-scale (e.g. nation-wide or sectoral) roll-out of such technologies/ practices. A key goal of the TRANSrisk project is to identify risks related to low-emission pathways in different country contexts. For that, the case studies analyse whether and how a transition pathway will have negative external impacts (consequential risks), and how these can be offset or mitigated by

positive impacts. The project also explores risks of unsuccessful implementation of a pathway (implementation risks) by exploring barriers that slow down or block a transition.

A key lesson learned from the international debate on 'green growth and sustainable development' is that low-emission transitions should be in line with the broader socio-economic development ambitions of a country/region. Moreover, a transition should not result in an unjustifiable increase of other environmental impacts (e.g. pollution swapping). Instead, transition paths that generate most 'wins' and minimise the 'losses' are likely to be most viable, and more likely to be adopted by communities.

Aside from any (un)wanted positive or negative impacts of a transition pathway, there can be a range of barriers preventing the uptake of a technology or practice. A systems analysis (considering policy mixes, stakeholder interactions, and contextual factors such as culture, habits, and religion) can show which conditions need to be met to successfully implement a transition pathway that is accepted by society. Several stakeholders attending the side-event acknowledged the importance of a better understanding of positive and negative impacts of low-emission transitions, and expressed a need to better incorporate this topic within the ongoing climate negotiations.

LOW-EMISSION TRANSITION IN LIVESTOCK FARMING IN THE NETHERLANDS

For the Dutch case study, two low-emission transition pathways for the livestock sector were discussed. The Netherlands has one of the highest livestock densities in the EU, and is the world's second largest exporter of agricultural products (after the US). The production of animal protein (dairy and meat) forms a substantial part of these exports. The first pathway focuses on a substantial

reduction of animal numbers in the livestock sector to reduce the environmental burden. The other pathway assumes that the current livestock will remain intact, but with an improved (integrated) management of animal manure. These two pathways were selected as they are able to contribute to multiple environmental targets (lower emissions to soil/water, air, and atmosphere). Reducing the cattle livestock sector by 37.5% is considered to be sufficient to meet an indicative sectoral GHG emission reduction target by 2030, while integrated manure management will require major investments in (several thousands of) manure digestion and processing facilities. Hence, both pathways are likely to have considerable socio-economic impacts in the country, in terms of for example costs and job losses. Further case study work will be performed to better quantify the overall costs and benefits of low-emission transitions in the Dutch livestock sector.

LOW-EMISSION TRANSITIONS IN KENYA'S ENERGY SECTOR: FEASIBLE, BUT CHALLENGES REMAIN

For Kenya, a key question is how to meet its goal of becoming a middle-income country by 2030, while also pursuing the low-emission pathway set out in its Intended Nationally Determined Contribution (INDC). The TRANSrisk case study focuses on Kenya's rapidly expanding energy sector. Under business as usual, GHG emissions from energy are expected to increase more than six-fold between 2010 and 2030, dwarfing the increases in transportation, agriculture, and land use change. Results from the TIAM-ECN model show that Kenya's INDC targets can be achieved with rapid and timely deployment of renewable energy sources. However, this would require a shift away from current government plans to expand the role that domestic coal will play in Kenya's energy mix (see Figure 1).

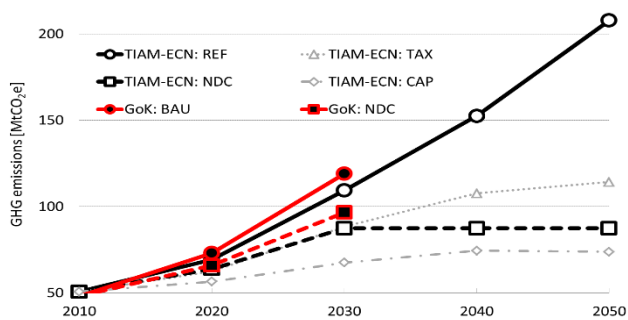


Figure 1: Scenarios from the global TIAM-ECN modelling work for Kenya. The red lines show the INDC emission projection by the government of Kenya (reference scenario and NDC scenario). The black lines show the TIAM-ECN scenarios (business-as-usual and NDC scenario).

Alongside rapid expansion of low-emission power sources, one of Kenya’s biggest challenges is to meet household demand for wood and charcoal. This currently makes up about 68% of Kenya’s final energy consumption. Data on the ‘sustainability deficit’ for charcoal supply in Kenya was presented, illustrating that forest wood for charcoal production is harvested at a greater rate than it can be replenished, thus leading to rising net GHG emissions. To avoid these emissions, charcoal consumption needs to be reduced through greater efficiency and increased supply of sustainable sources of biomass. Understanding the factors that influence stakeholder behaviour in this complex value chain is a key focus of the case study research. Through a combination of scenario modelling and stakeholder engagement, the case study analysis could support Kenya in its challenge to establish a low-emission energy sector.

LOW-EMISSION TRANSITIONS IN SANTIAGO DE CHILE: LINKING CLIMATE AND LOCAL POLLUTION

Chile faces increasing energy demand due to projected economic development and improved public welfare. Consequently, there is increasing pressure on the environment, both in terms of GHG emissions and local environmental pollution. The Chilean TRANSrisk case study aims to explore synergies between efforts to reduce emissions of

GHGs and local pollutants, against the backdrop of a growing economy. The focus of the case study is on the capital, Santiago.

With over 40% of the country’s population and many companies being located there, Santiago accounts for over 50% of Chile’s total CO₂ emissions.

Moreover, the city faces serious air quality problems. An important difference between climate change and local air pollution is that the latter is much more visible and has a more direct impact on the community. Since potential practices to reduce local air pollution often also contribute to GHG emission reduction, this provides a scope for linking local air quality actions with efforts to combat global climate change.

Therefore, the main objective of the continued work in this case study is to identify technologies, practices, and policies to develop synergetic solutions that mitigate both global GHG emissions and local environmental impacts.

SIDE-EVENT PRESENTATIONS

The presentations delivered during the TRANSrisk side-event in Marrakesh can be downloaded from the TRANSrisk website’s [event page](#).



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TRANSrisk project aims to innovatively transform the way in which climate change policy pathways are developed. The focus is to support EU and global climate change goals by providing analytical tools for risk and uncertainty aware policy making. For more information visit our site: www.transrisk-project.eu

