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Energy research Centre of the Netherlands

ESCAPE: Energy Security and ClimAte Policy Evaluation

The ESCAPE approach - Energy Security and ClimAte Policy Evaluation - suggests that linking climate change policy with security of energy supply may improve climate policy at both national and international level. On the level of measures, many synergies exist resulting in more cost-effective approach. As well, linking the supra-national benefits of combating climate change with national interests of energy security may provide more common ground between countries currently divided over an international approach to climate change.

National level

Security of energy supply is a major policy issue in many world regions. Dependency on imported oil and gas is likely to increase sharply for the US, the EU and China. US energy policy relies heavily on oil for the next decades. In addition, it focuses on creating incentives for new technologies and leaves it up to the market which energy sources will increase shares in the energy mix. To this extent, the energy security position is not likely to be beneficially influenced by energy policy. This is in contrast to the government's strong preferences for reducing imported oil and gas dependency. Many measures that can be taken in order to enhance security of supply are synergetic with climate change measures, such as renewable electricity, biofuels, nuclear power, hydrogen fuel (from renewable sources or fossil-based with carbon dioxide capture and storage). This paper puts forward a number of options that reduce import dependency as well as GHG emissions.

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International level

Security of supply issues have to date not been included in climate policy negotiations and is not mentioned in any post-2012 climate regime proposal. However, as this issue deals with national interest, it could be a means to address the difficult issue of collective action in climate negotiations. Therefore, we recommend that, where possible, security of supply interests be integrated in post-2012 climate policy strategies. This will appeal to all major world regions and therefore, can streamline this issue into climate negotiations to utilise synergies. This will create a broader basis for future climate policy, involving more stakeholders over a range of policy areas. The advantage of energy security as a national interest is also an inhibiting factor for streamlining this issue into international climate regime in the form of global targets similar to the top-down approaches in currently proposed post-2012 frameworks. As the synergies between the two policy areas are mainly on a technological level, post-2012 regimes that include sectoral bottom-up elements or technology-based approaches would provide the most promising linking options. For example, groups of countries agreeing on approaches to combat both climate change and energy security threats may aim to link these into one convention. Due to the different nature of the problems, options for linking on a global scale appear to be less likely achievable.

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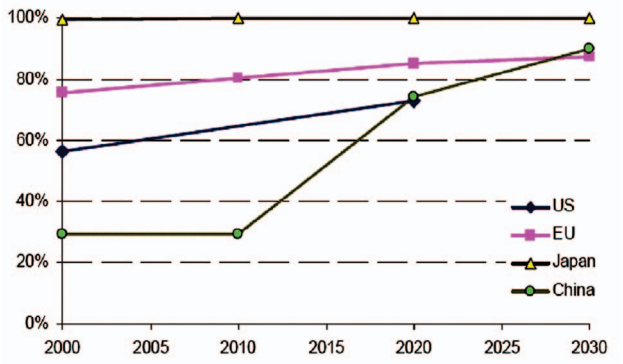
Emission trading instruments are likely to be part of any post-2012 climate regime, even though the design of such a regime is not within sight given current international situation. Instruments such as the current Clean Development Mechanism and the EU Emissions Trading Scheme provide interesting options to develop links with energy security. For the CDM, a new type of CER (carbon credit) can be designed to include an energy security criterion. This would in general favour projects that reduce CO_2 over other greenhouse gases, as the former often entail a benefit for the host country energy security situation.



Import dependency: imports as percentage of total consumption

This adds to the sustainable development component of CDM projects, which are often stronger in CO_2 reduction projects. Regarding instruments such as the EU ETS, governments may reward companies that comply by reducing their emissions compared to those buying allowances on the market.

Qualitative assessment of interaction between security of supply (SoS, mainly import dependency) and climate change (GHG emissions) of energy policy measures in the US.'+' Indicates an improvement, '0' no significant impact, and '-' a negative impact.

Energy option	SoS impact	GHG impact	Comments
Oil transport routes	0/+	-	keeps import dependency but diversifies supply routes
Coal	0[1]	-	Continued use attractive to due to cheap domestic supplies; air pollution is concern
Clean coal technology	+	+/0	Promising for improving air quality; Several technologies already commercial (IGCC, supercritical PCC[1]); allows for continued coal use with improved efficiencies
CO_2 capture and storage	0[3]	+	Technology in demonstration phase; likely important option in mid-term; allows for coal use to be continued; synergy with hydrogen economy
Natural gas power	-	+	
Natural gas in transport sector	+/-	+[4]	Reduces oil dependency but increases gas imports; air quality co-benefits
Biofuels transport	+	+	Opportunity for US farmers; already strong subsidies in place as well as target
Biomass power	+	+	
Hydro	+	+	Most potential already harnessed
Other renewables	+	+	Wind particularly promising
Hydrogen[5] transport	+	+	Likely to be a major option in the long-term to reduce oil dependency
Nuclear fission	+	+	Currently projected to decrease slowly; terrorist attack sensitivity and waste disposal
Energy efficiency	+	+	Major cuts in energy intensity possible; current policy could be strengthened

[1] US is likely to become a net coal importer in the next decade but this will not significantly impact energy security. Most important countries from which coal is imported are Columbia, Venezuela and Canada.
[2] Pulverised Coal Combustion
[3] CO_2 capture and storage would allow for continued use of coal with limited climate impact and so increase energy security compared to an equivalent of gas-fired power plants. On the other hand, it reduces the conversion efficiency of a power plant and thereby increasing the demand for (imported) coal.
[4] Particularly effective when replacing gasoline, less so in the case of diesel
[5] from coal gasification, with CO_2 capture and storage

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