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ELEMENTS OF EUROPE'S ENERGY UNION

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POLICY CHALLENGE

To meet the EU's objectives for emissions, electricity supply and gas security of supply, well-designed European markets could provide better results at lower cost than uncoordinated national approaches. In other areas – such as energy efficiency and supporting innovation – markets alone might not be enough. Europe should thus rethink its quantitative headline targets for 2030. The proposed 40 percent decarbonisation target is in line with a stronger emission allowance market, but the target for renewables should be defined in terms of innovation rather than deployment, and the energy-efficiency target should be defined in termst

to increase with the rising shares of renewables in the power

12. Delegating powers to community agencies faces legal constraints ('Meroni Doctrine') which have been discussed in the context of the institutions of the 'Banking Union'.

13. In addition to increasing the manpower, resources should also include open models of the European energy system in order to have a common basis of discussion.

14. See Zachmann (2013a).

15. Between 2008 and 2012, about 2 billion of the 10 billion issued allowances were not used because of the recession (500 million), inflow of international carbon credits (1420 million), exceptional allowances allocated in 2012-13 (500 million), replacement of fossil plants by publicly supported renewables (200 million) and energy efficiency measures (150 million).

16. The percentage values (1.74 percent and 2.2 percent) refer to the average total quantity of allowances issued annually in 2008-2012. That is the

investment if not properly shielded from the market. If, for example, Europe financially supports a pipeline from Turkmenistan, the business case for the corresponding volume from the Levant region might disappear. Furthermore, national managed approaches regularly fail to select the most efficient options (eg demand curtailment, storage, LNG plants, pipelines, domestic production, domestic fuels).

So neither the current market design nor *ad-hoc* managed approaches appear well suited to efficiently ensure gas supply security. We therefore propose a market for 'reserve supplies'. Each domestic gas supplier would be legally required to maintain a certain amount of alternative supply, such as 20 percent of the contracted energy demand for three years. Suppliers can meet their obligation through different options such as (i) interruptible contracts with their consumers, (ii) volumes in storage, or (iii) option contracts with other domestic and foreign suppliers. Europe's suppliers would need to make sure that the transport capacities – pipelines and terminals – needed to deliver the corresponding volumes to customers are available. Furthermore, reserve supplies could not be met by options involving pivotal suppliers/infrastructure. That is, holding an option for additional supplies from Russia would not qualify as reserve supplies. To ensure this, pivotal suppliers/infrastructure will have to be identified. In case a supplier finds itself in a situation in which all existing infrastructure is either already used or pivotal, it will have to invest in new infrastructure. Suppliers would only be able to draw on these reserve supplies in security crises following an official declaration. This system, the cost of which the domestic suppliers will largely pass through to their customers, should ensure security of supply for all at lowest cost and without undermining the internal market.

Such an approach would obviously have distributive effects. Consumers in well-connected regions that face a very limited risk of supply disruptions will have to pay for 'their' share of reserves, which most likely only their less well-connected neighbours might need. But this solidarity will not wash away regional differences arising from different infrastructure endowments because suppliers in areas with less-developed infrastructure will find it more costly to ensure the level of supply security. This is efficient because it provides an incentive against locating the most vulnerable sectors in vulnerable markets. For example, a chemical plant in Cyprus will only get an interruptible contract because no supplier could affordably secure the required reserve capacities.

RES-INNOVATION TARGET

Since the EU 20 percent target for renewables was decided, some of the reasons for investing in renewables have become less urgent. There is less risk that fossil fuels will run out quickly, more reliable suppliers are entering the global energy market[22] and a global agreement to mitigate greenhouse gases seems distant. Nevertheless, in the longer-term, issues such as dependence on imports from uncertain sources and rising hydrocarbon costs will return. Most importantly, affordable decarbonisation of the energy sector will require compet-
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ever, the deployment target should be broken down to technology-specific targets and developed as part of an innovation policy that optimally supports a broad portfolio of technologies at different stages of maturity. A revised Strategic Energy Technology Plan[25] could form the basis for defining measures and allocating support to technologies.

The current and envisaged renewables policies are not focused on innovation. Europe currently spends on relevant R&D about a hundredth of what it spends on renewables deployment (Figure 3)[26]. It does not integrate its deployment and R&D policies into a strategic innovation policy and does not coordinate its deployment policies across borders.

ENERGY EFFICIENCY

The key tool to ensure efficient energy usage is confronting all users with market-based price signals. Wasteful usage does not only refer to using more energy to produce a certain good, but also artificially maintaining a specialisation in energy-intensive goods. As Europe should not strive to subsidise labour costs to make the European textile industry competitive with Asia, Europe should not subsidise energy costs to make European aluminium production competitive with the US, especially as defending energy-intensive sectors at all cost locks in high energy consumption and implies that Europe needs to draw on more expensive supplies for all other sectors.

Beyond the issue of prices, the question is if energy efficiency needs to be regulated and if this should be done at European level. The need for regulation is often deduced from the finding that even efficiency measures with positive net present values are not delivered by the market[27]. As energy efficiency is an issue in virtually all sectors, there is a myriad of existing and proposed measures. So, energy efficiency policies can be welfare enhancing, but their efficiency depends on their design.

The same holds for the question of subsidiarity. The obvious argument for a European energy efficiency policy is its interdependence with the single market. National product energy-efficiency standards, national energy-efficiency schemes for energy companies or even dis- energy efficiency po depolnefeploy- suppoomeh of Over-icnergcean aluntn Tw(energy efficienc neiall oaddo aglasuhoargu-aarieds nch TDoduct enes of efficiency nologeogies woul.

be safeguarded by the market design and that Europe imports more than half of its energy needs , we focus on the later.

22. For example, liquefied natural gas exports from the US and Australia.

23. Primary consumption of oil, natural gas and coal amounts to about 6 percent of global GDP. Adding the value of existing non-fossil electricity production (about $2 trillion), energy downstream cost and demand side appliances, it is likely that a global market for new energy technologies would amount to more than 10 percent of world GDP.

24. Over-generous support in fact appears to reduce producers' incentives to aggressively compete on innovation. The ten largest solar panel producers all spend below 5 percent on R&D, compared to 10-20 percent in the semiconductors sector (www.pvtech.org/friday_focus/friday_focus_rd_spending_analysis_of_top_10_pv_module_manufacturers).

25. For example Zachmann *et al* (2012) and Ruester *et al* (2013).

26. Public spending on deployment has been

Two targets would then serve to benchmark the success of the overall policy framework up to 2030: one for total incentivised energy savings (eg more than 400 Mtoe of induced energy savings between 2020 and 2030) and one for total energy efficiency policy cost (eg less than €100 billion). This target might be broken down by member state (or even to sub-national level) and even made binding.

CONCLUSION

Policy and market failures in the energy sector are common. There is too little energy saving, too little investment in security and innovation and emissions are too

This would be a radical step-change in European energy and climate policy, but so were the 2020 targets. But in planning for 2030, Europe cannot avoid substantially revising the governance of its energy sector, without compromising on security of supply, sustainability and competitiveness.

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two orders of magnitude larger (in 2010 about €48 billion in the five largest EU countries in 2010) than spending on RD&D support (about €315 million).

27. Reasons discussed are myopic preferences of consumers or split