PORTFOLIO COSTS OF RENEWABLE ENERGY SUPPORT SCHEMES: PRODUCER SURPLUS VS. ALLOCATION EFFICIENCY EFFECT

Grzegorz Peszko, EBRD, peszkog@ebrd.com, +44 20 7338 6351
Janina Ketterer, ifo Institute, ketterer@ifo.de, +49 89 9224 1433

Overview

In the European Union deployment targets and industrial policy objectives drive support for renewable energy. Therefore effectiveness (share in generation mix) has attracted more attention than efficiency. However, recent costly experience with solar PV boom-and-bust in a number of EU countries brought the issue of costs of support back to agenda. As the share of renewable energy in generation mix increases, the legacies of costly support systems may undermine public support for renewable policies especially in the age of austerity. This pose a threat to long-term sustainability of the business, which still relies on consumers' willingness to pay a price premium for green power. When inefficient policies hit affordability or public acceptability constraints they tend to be stop-and-start, erratically adjusted, shaking investors' and public confidence.

"Qualified" RES support systems (adjusted to the generation costs of different technologies) are expected to reduce surplus of low cost renewable generators and encourage larger share of less mature and more costly technologies in renewable energy mix. The total cost of support across the portfolio of all renewable technologies in a country would depend on the relative weight of the producer surplus and allocation efficiency effects. In addition, social cost of support is influenced by other subsidies, including investment grants or tax breaks. This study aims at testing the impact of all these effects on the social cost of support.

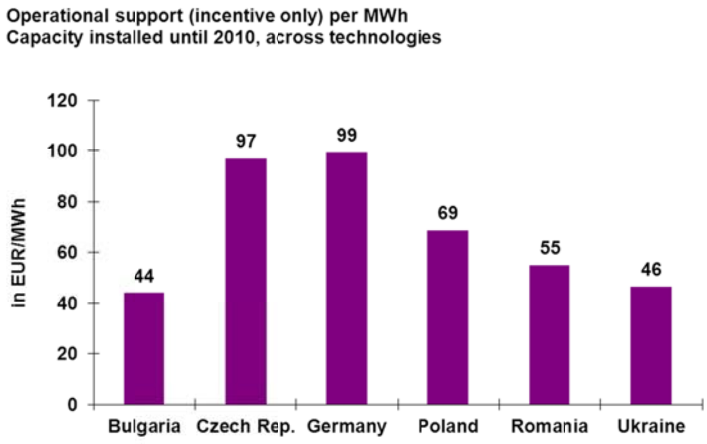
The social cost of renewable support is estimated for all technologies installed until 2010 in a sample of countries. Germany, Bulgaria, Czech Republic and Ukraine represent countries with feed-in tariffs (FIT). Poland and Romania are selected from the countries with tradable green certificates. Whereas Poland runs a technology-neutral quota system, Romania introduced technology-specific multipliers at the end of 2010. Where these policies are overlapping with investment support, these subsidies were recalculated as price support equivalents and included in the comparison.

Methods

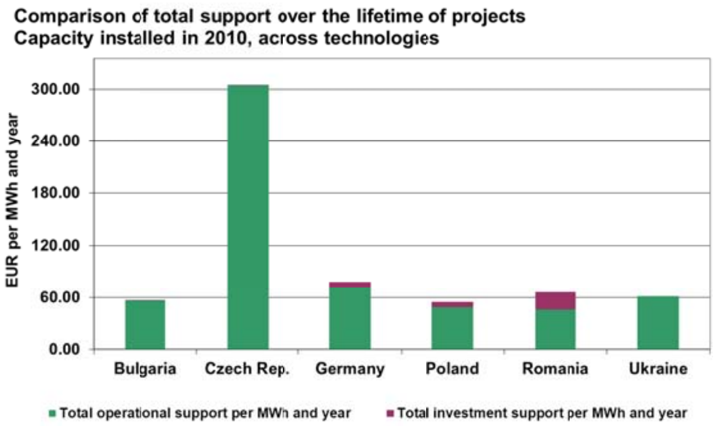
The dominant approach in the literature is to take efficiency of renewable support systems as tantamount to the size of producer surpluses for individual renewable technologies considered in isolation. This paper follows the different approach, first by analysing cost-effectiveness as the total social cost (producers' cost and producers' surplus), and second, by considering the whole portfolio of renewable technologies in a country or region. The third novelty is that the cost of support metrics adds all forms of available support, including operational and investment subsidies.

Results

The upper graph shows the costs of operational support for all renewables installed until 2010. The cost of support is very sensitive to renewable energy mix. Countries with high solar PV tariffs and therefore high solar installation rate face a higher cost of support. This is very pronounced in Germany and in particular in the Czech Republic, which was late with tariff adjustment in 2010 and experienced rapid boom of solar PV installations with 1500 MW added just in 2010 (see lower graph). The Polish TGC costs are lower, because technology-neutral support attracted large share of low cost technologies, such as biomass (including co-firing) and wind, although co-firing of biomass entertains large windfall profits. Bulgaria's costs are small as 60% of renewable generation comes from hydro. The figures depict only the operational support, e.g. FIT (net of electricity price) or the TGC.



The lower graph shows the lifetime cost of renewable capacity installed just in 2010 to illustrate the impact of solar boom in the Czech Republic. The figures include the operational support, e.g. FIT or TGC (green bars) as well as the investment support (purple bars). Investment support adds additional cost layer in Poland and Germany, and is particularly high in Romania.



Conclusions

At least in a sample of countries the allocation efficiency effect has so far prevailed over producer surplus effect. Equi-marginality principle that drives allocation efficiency within the portfolio of renewable technologies does matter. Our results support the view that technology neutral support systems are less costly to consumers that technology-specific “cost-plus” systems. The type of support scheme (FIT or TGC) has less impact on the cost of support than technology “qualification”. Solar PV boom-and-bust in Europe revealed that because of information asymmetry between generators and regulators the timely adjustment of technology specific rates to harvests producer surplus is very difficult. The costs of delays are significant and may lead to distortions in investment decisions causing technology booms, which are often followed by ad-hoc policy changes, loss of investors’ confidence and eventually technology busts. This may undermine long-term support for renewable energy by consumers and investors alike.