

## **ENCOURAGING HOUSEHOLDS TO GO GREEN: Evidence from Belgium that upfront subsidies for investing in solar panels work best**

Solar panel subsidies work best if the government pays for the installation costs than if it buys generated energy. That is the central finding of research by **Olivier De Groote** and **Frank Verboven**, to be presented at the annual congress of the European Economic Association in Mannheim in August 2015.

Climate change, energy shortages and natural resource depletion are all important reasons to encourage renewable energy, but encouraging households to take part still costs time and money. In Belgium, the government offered very generous subsidies where households could sell energy generated from solar panels at a guaranteed price, which dropped over time as the cost of installing them fell.

The research examines how households responded to changes in the price of solar panels and the value of the subsidies. It finds that they care more about immediate gains to the point where they value €810 today the same as €1,000 in a year's time. Thus, energy subsidies had to be very high to encourage people to install solar panels, and involved a 20-year commitment. This ultimately means that the government could have saved over €2 billion by reducing the immediate costs instead of advertising the future gains. The authors conclude:

'The results of our study have important implications for future policies to stimulate the adoption of green technologies by households. It is important to use subsidies to decrease the initial investment costs and not future gains from the investment, as this could lead to more adoptions at a much lower cost.'

### **More...**

Because of increasing warnings about global warming, energy shortages and depletion of natural resources, a lot of attention is going to the need to promote sustainable energy production. But not much debate has focused on efficient ways to subsidise households to make the necessary investments.

In a recent study at the University of Leuven, Olivier De Groote and Professor Frank Verboven evaluate the subsidy programme for solar panels in Flanders, the northern part of Belgium.

They find that most households do not sufficiently take into account the future when deciding to invest in solar panels. As a result, the subsidies for the future production of electricity from solar panels had to be excessively high.

The government would have saved over €2 billion if it had instead provided higher upfront investment subsidies, to which consumers are more responsive. The government has thus essentially shifted the subsidy programme to future generations and it is paid for by consumers in the form of higher electricity prices.

Flanders granted very generous subsidies for solar panels from 2006 on in the form of Green Current Certificates. These certificates were granted for the amount of energy produced with the solar panels, and they could be sold at a guaranteed price. The subsidies dropped over time when solar panels started to become cheaper until they

disappeared in 2013. In Flanders, prices of solar panels decreased by more than 50% between 2009 and 2013.

The authors use a rich data set on adoptions in Flanders and apply an econometric model to distinguish between responses to price changes and responses to future subsidy changes. They find that households are much more responsive to immediate financial gains because of lower prices, than to postponed gains from the Green Current Certificates. Households value €810 today the same as €1,000 for which they have to wait a year.

Therefore subsidies in the form of Green Current Certificates had to be very high, to lead to adoptions of solar panels. The cost of this policy is large because these subsidies were promised for 20 years into the future. Therefore early adopters are still benefiting from very generous subsidies, while non-adopters are paying for it in the form of increased electricity prices.

There can be several reasons why households respond less to future financial gains. They might not have sufficient money to invest and be unwilling or unable to borrow it. Another reason can be reliance on 'payback period' calculations. With this method, people calculate how many years it takes to gather sufficient benefits to cover the investment cost and it has been used a lot by installers to convince people to adopt.

The problem with this approach is that it ignores how well the investment performs after the payback period is reached. Since solar panels in Flanders often had payback periods of only four years while they have an expected lifetime of over 20 years, a lot of the benefits get neglected.

The results of this study have important implications for future policies that stimulate the adoption of new (green) technologies by households. It is important to use subsidies to decrease the initial investment costs and not future gains from the investment, as this could lead to the same or more adoptions at a much lower cost.

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