Understanding the bumpy road to resource efficiency: from the concept of 'barriers' to 'webs-of-constraints'

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Summary (about 150w)

This paper argues that single factor explanations for resource inefficiencies do not offer a lot of mileage*:* in practice there are compound causes for why resources are not used more efficiently. This has the following policy implication: instruments that do not address systemic interactions tend to be ineffective. Therefore, there is a need for policy *mixes* that are mindful to web-of-constraints to RE. The design of a far-reaching policy strategy on resource efficiency requires systemic changes operating at different levels including business models, social consumption patterns, and regulation. After a review of the literature on 'barriers to resource efficiency' and a conceptual introduction of the notion of 'webs-of-constraints', the paper elaborates the concept of 'webs-of-constraints' in two case studies: one about energy efficiency in domestic housing and one about car mobility in urban areas. We give examples of policy mixes that adress web-of-constraints to RE in the two cases.

Extended summary (600-1200w)

This paper provides a novel conceptual framework to address the important question: why are resources not used more efficiently? Various studies apply the notion 'barrier to resource efficiency', suggesting there is a single and concrete factor that explains resource inefficiency, a factor that can individually be tackled and removed by for example a specific policy instrument. We propose to move beyond the notion of 'barrier' and offer and develop the notion of 'webs-of-constraints' to resource efficiency.

The notion of barrier is very often too simplistic or even misleading. For instance, it may suggest a blockage to a desired behaviour, which is not wholly warranted for situations in which the behaviour is not desired but altogether resented by the person. It is best used to refer to factors which stand in the way of what people would like to do (e.g., drive less and eat less meat). When people do not have a desire for driving less, the lack of desire could be considered a barrier but this is not how the person concerned sees it. People's preferences have deeper causes which are difficult to uncover and to determine with any precision.

Resource efficiency is shown to depend on many factors interacting with each other dynamically. Demand and supply are part of causal loops involving positive stimuli and hampering factors, creating a web of drivers/enablers and a web of constraints. The web-of constraints metaphor that we propose moves beyond the 'barrier' perspective and takes an integrative and evolutionary perspective. It suggests a blocking mechanism that includes people's preferences, their life circumstances, the character of established business models and two-layered policy context (national and EU-level).

An important policy implication of this is that instruments that do not address systemic interactions tend to be ineffective. Therefore, there is a need for policy *mixes* that are mindful to web-of-constraints to RE. The design of a far-reaching policy strategy on resource efficiency requires systemic changes operating at different levels including business models, social consumption patterns, and regulation.

After a review of the literature on 'barriers to resource efficiency' and a conceptual introdcution of the notion of 'webs-of-constraints', the paper elaborates the concept of 'webs-of-constraints' in two case studies: one about energy efficiency in domestic housing and one about car mobility in urban areas.

Regarding the latter, the emergence of electrical car sharing in Paris, Autolib, is key example how a web-of-constraints may develop into a web-of-drivers, if some developments occur at the same time. Introduced in late 2011, the scheme attracted 70,000 users by April 2013. Autolib is bigger than similar schemes in Berlin and Stuttgart, mainly because of three local drivers occurring simultaneously. First, the project has become a shop window for the French billionaire Vincent Bolloré, who invested two billion euros in electric vehicle technology without shareholder pressure. Secondly, the scheme is also a prestige project of the Socialists, Paris' largest party, and part of their drive to win a third term in Paris' municipal elections in 2014. The city of Paris has invested 35 million euros in the charging points (although it remains a majority privately-funded scheme, with Bolloré spending 50 million euros a year to run Autolib). Thirdly, many local travellers are familiar with the successful bicycle sharing service Velib, making car sharing a relatively small step for those tired of the parking pressure in Paris. These three factors can reinforce each other further.

But concurrently there are also developments that promote alternatives or weaken Autolib: the development of cleaner ICE vehicles will decrease the relative environmental attractiveness of electric vehicles, the local political climate may shift and Autolib may stop to be a prestige project, Bolloré is the single operator which slows the speed of learning of Autolib and, lastly, some green travellers may shift to public transportation when the system grows in seize. The web-of-drivers then develop back into a web-of-constraints.

The example shows that innovation (be it new business initiatives or new policies) take place amidst an existing web of relationships that include 'webs-of-drivers' and 'web of constraints'. The limits of policies are reflected in the fact that they are only one among many types of factors and relations. This web greatly affects the further progression and impact of the innovation and the scheme helps to put a single development in its socio-technical context. The key policy implication is that instruments that do not address systemic interactions tend to be ineffective. Therefore, there is a need for policy *mixes* that are mindful to web-of-constraints to RE.

In the paper we give examples of policy mixes for the two cases that we elaborate: energy efficiency in domestic housing and resource efficiency in urban mobility.

[*„This paper presents preliminary results of the European POLFREE project, which explores of new concepts and paradigms that can bring about a radical increase in resource efficiency, and a vision for a resource-efficient economy in the EU, with suggestions also for new more resource-efficient business models for firms, and ideas for a global governance regime. Several other abstracts that are submitted to this conference present work from this project. We suggest to group them together in a session"]*