



## POLICY BRIEF

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# What creates a successful resource efficiency policy?

## SUMMARY

- *The policy mixes which have been most successful appear to be those which:*
  - *intelligently define the boundaries of the system they seek to change (like the sector, or a specified traded resource),*
  - *meet the challenge of 'lock-in' to current activities,*
  - *and use evidence-based targets to deliver predictability.*
- *Past resource efficiency policy success has mostly come from changes with few negative knock-on effects. For example, in Ireland, plastic bags were easily substituted with other bags, without affecting peoples' activities.*
- *Where there are significant knock-on effects with other activities, less progress has been made. For example, rebound effects have reduced efficiency gains, and loopholes granted to limit related adverse consequences have reduced policy impact.*

## 1 Investigating what works

**We analysed cases of resource efficiency policy to find out why some succeeded and some failed to meet their objectives**

Around 68 billion metric tonnes of material were extracted globally in 2009, to meet resource demands. Averaged across the world's population, that corresponds to the weight of 10 small cars per person. And that amount increases every year.

To make Europe more competitive by reducing costs, less dependent on resource imports and reduce the environmental impacts associated with resource extraction/production, transportation and transformation, policy makers have developed policies to improve the efficiency of the use of resources such as metals, water, biodiversity and fertile soils.

Some have succeeded and others have failed in their objectives. This brief provides an overview of the factors that appear to have shaped success and failure to date. It is based on two pieces of new research by our leading experts in resource efficiency policy.

We analysed specific cases, to gain insights into what works, for example...

- In Denmark, a range of instruments, with regulatory measures at the core, were implemented to reduce harmfully excessive fertilizer use. Nitrogen fertilizer use fell by almost 50% between 1990 and 2011.

And examples of what hasn't worked so well, for instance....

- A policy mix of regulation, certification and voluntary schemes helped Finland reduce consumption of domestic forest products and increase its forest stock. Increased imports of cheaper forest products from outside Finland have undermined the progress made domestically, illustrating that the reach of policy needs to match the range of the relevant economic activity.

**We found:**

**5 types of inefficiency and**

**5 types of drivers of inefficiency.**

## 2 Seeing the inefficiencies

### 2.1. Five types of inefficiency

We found that the general problem of inefficient resource use hid different shapes of problem. Understanding this was a key to unravelling when policy is likely to be effective. We found five types of inefficiencies:

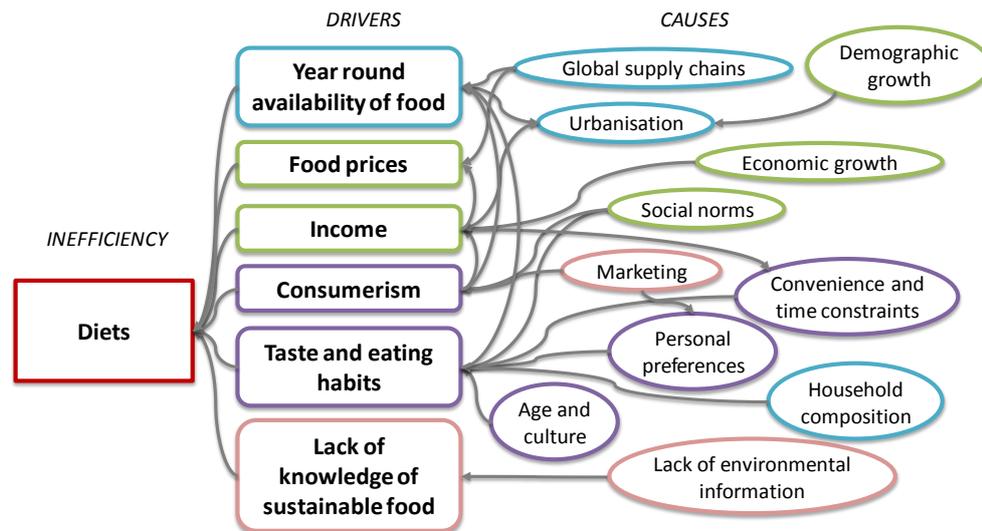
- The waste of resources which are by-products of production or discarded products (i.e. waste), but which could be more productively reused, recycled or transformed. Twelve billion tonnes of the material inputs into the global economy become waste every year.
- Unsustainable or sub-optimal resource exploitation, for example where the rate of exploitation of a renewable resource - like a fish stock - depletes the stock beneath the levels where it is most productive.
- Technical inefficiencies where fewer resource inputs could produce the same outputs - improvements in crop yields per unit of fertiliser (or irrigation water) input, or reducing energy losses in electricity transmission.
- Consumption of products or services which require more resources than alternative ways to provide the same function or service. Reared beef typically requires 16kg of feed to produce 1kg of meat, whilst 1kg of chicken meat needs 2-3kg of feed, and 1kg of farmed fish requires 1.5-2kg of feed.
- Societies collectively engaging in high-material consumption lifestyles, when lower-material consumption lifestyles and choices can bring the same, or higher satisfaction.

Often, inefficiencies overlap and need tackling together. For example, EU average waste generation could decrease by 12 to 62kg per capita/year by 2020 if three of the inefficiency types above - waste, technical inefficiencies and alternative product consumption - were tackled together.

### 2.2. Naming the drivers of inefficiency

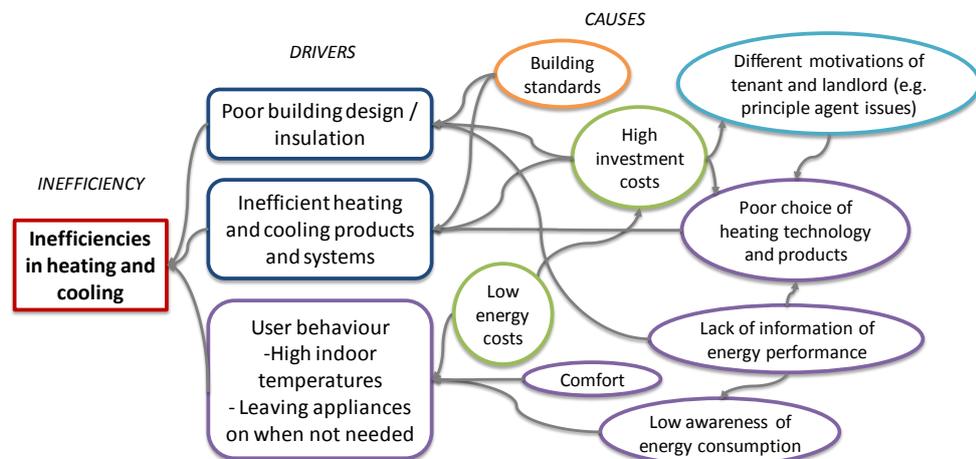
Policy which has successfully tackled inefficiencies seems to build on a thorough analysis of the main drivers behind the inefficiencies. These drivers are often far from simple and linear. For example, below is a simplified schematic for drivers of dietary choice:

**Drivers of inefficiencies are often far from linear**



**Figure 1, Drivers of inefficient dietary choice**

The drivers of inefficient resource use can broadly be grouped into five categories: behavioural, technological, institutional, socio-economic and bio-physical drivers. Looking within these categories, the drivers become specific to the problem. They include governance structures, mental models, trade patterns, resource prices and infrastructure design. The figure below shows the drivers for inefficiency in heating and cooling of buildings, which are very different to inefficiency in dietary choices:



**Figure 2, Drivers of inefficiencies in heating and cooling**

We identified some key factors which increase or decrease the chances of success of policy mixes

### 3 What did we learn about successful and ineffective policy-mixes?

Our case studies of past and existing resource efficiency policies in EU Member States and third countries formed a picture of factors of success and failure.

- In Ireland, a mix of policies - including voluntary measures, awareness-raising and a tax on plastic bags - led to a reduction in plastic bag use of 90% within five months. A key factor was the ease of substitution of an alternative - bags made of other material - which meant the switch had few wider effects on the economy or consumer behaviour. It's an example of how policy success in resource efficiency comes more easily when it

tackles activities that can be changed without significant wider knock-on change, in this case activities with relatively insignificant resource impact.

- In Icelandic seas, cod stocks increased from 500,000 tonnes to 1.2 million tonnes between 1992 and 2012, mainly thanks to the implementation of a policy mix of total allowable catches, individual tradable quotas and a resource tax. The participative design of the policy-mix and its stepwise introduction meant that, in the short-term, it had relatively limited few wider negative side-effects on the economy which were by far outweighed by the prospect of a long-term availability of healthy stocks.

In general, where inefficient activities had more complex inter-linkages with wider economic activities, policies tended to be more difficult, and less successful. Some key factors of success:

- 1. Mixes of policy instruments need to be matched to the main drivers of inefficiency in a 'system'. For example, efforts to reduce CO<sub>2</sub> emissions in Spain through a policy mix focusing on providing information appeared to have a very weak impact, at best. There were wider drivers of CO<sub>2</sub> that went untackled.**

This also corroborates the OECD's often quoted recommendation to have one policy instrument for each driver of inefficiency (or market failure). Often drivers inter-relate in ways which makes them resilient to change resulting in a 'lock-in' that makes it challenging to achieve the sought outcome.

- 2. The boundaries of the 'system' being tackled needs to match the economic reality. Successful policies tend to be sufficiently focussed (e.g., on a sector or a particular resource) but at the same time not so focussed that impacts are not undermined by knock-on effects on trade or changed behaviour.**

For example, not tackling wider effects is one common policy gap, particularly in relation to 'leakage' (shifting the production related emissions to other parts of the world) and 'rebound effects'. These effects occur when policy which successfully improves efficiency in one area (a) leads to an increased overall consumption of a given good/item that offsets the resource efficiency gain or (b) leads to the use of resources elsewhere in the wider economy. Just as we as individuals would spend money saved by more efficient heaters on something else - like eating more beef.

In the Finnish example above, a more sustainable management of Finland's forest was achieved, but imports of wood from outside Finland (where sustainable production is not guaranteed) also increased.

- 3. Where pressures emanate from a wide range of disparate sectors or actors, and/or the resource targeted is an internationally traded commodity, designing an effective policy mix is much more challenging. The mix needs more complexity. It also needs wider breadth of coverage - often including the reform or phasing out of contradictory policies (like fossil fuel subsidies).**

Coherence is a crucial success factor. A German goal for a reduction of 'land take' to 30 hectares per day by 2020 has made modest progress, with contradictions in the policies affecting the drivers for land take.

For example, information tools have been found to be useful supporting instruments, but used in isolation they will often fail to deliver the scale of change sought.

4. **Political acceptability is necessary. Predictability and evolution of policy over time to reach ambitious goals play a big role here.** When Denmark reduced phthalate use in PVC, they did so in a strategy with a 10 year target, achieving 50% reductions. This appears to be a much more effective option than weakening policy mixes through introducing compromise loopholes.
5. **Well-defined monitoring of progress towards scientifically based targets, coupled with regular review of policy tends to increase the long-term effectiveness of policy mixes.** For example, Japan's efforts to promote a 'Sound Material Cycle Society' evolved after a policy review, for example by including over-arching targets.

#### Authors:

## 4 Authors and References

This policy brief draws on two reports by experts in:

Ecologic Institute, IEEP, Bio Intelligence Services, Policy Studies Institute and the Swedish Environmental Research Institute.

These are called:

"**The underlying reasons for resource (in)efficiencies**", May 2013 and

"**Comparative Analysis of Policy Mixes addressing natural resources**" March 2014

They can be downloaded from:

<http://dynamix-project.eu/results>

References to the numbers quoted in this brief can be found in those documents.

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