

Abstract of study:

**Financial instruments for a circular economy**

(Financiële instrumenten voor een circulaire economie, 18/04)

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**Study 'Financial instruments for a circular economy'**

The use of taxes, subsidies and public procurement can accelerate the transition to a circular economy. Smart use of these financial instruments will reduce environmental damage and uncertainty about the supply of raw materials in the future, as well as creating economic opportunities through more efficient use of raw and other materials, and new business models. Moreover, reducing consumption of raw and other materials, combined with emphasising recycling and reuse, will lead in many cases to a decrease in environmental damage in the form of CO<sub>2</sub> emissions, because less energy will be needed for the production process.

This is the key message of the study *Financial instruments for a circular economy*, which the Social and Economic Council of the Netherlands (SER) published in May 2018. The report identifies the criteria for the use of financial instruments that can stimulate the circular economy and details areas of concern and research questions.

A general conclusion is that there is still too little understanding of the specific effects of financial instruments on different raw materials, chains and sectors. A clearer picture of this is necessary to ensure that society accepts the introduction of financial instruments. Thinking through which financial instruments are effective needs to be accompanied by policy that will minimise undesirable side effects for society.

**Promoting the circular economy and the policy mix**

The SER defines a circular economy as an economy that deals with products, materials and resources in an efficient and socially responsible way within ecological constraints, so that future generations will also have access to social prosperity. Working towards a circular economy is therefore not an aim in itself, but a means to achieve future prosperity. For citizens, the central concept is 'quality of life'.

Closing raw material cycles as much as possible enables us to tackle two interrelated problems: on the one hand, the looming shortage of raw materials as a result of exhaustion or limited market access (e.g. due to geopolitical tensions) and on the other hand, pollution of the living environment through extraction, production, consumption and waste. The environmental effects of production and consumption and the consequences of future raw material shortages are currently not – or not sufficiently – reflected in market prices.

By doing business in a circular fashion, sectors that depend on raw materials can be future-proofed and new economic activities can be created. This creates economic opportunities, which have the effect of preserving employment and enabling job creation in new circular activities. Companies are still failing to take full advantage of the opportunities offered by the circular economy. Internalising all the costs to society that are incurred throughout the chain from raw material to waste supports the transition to a circular economy.

To promote the circular economy, the government can apply measures that motivate companies or consumers to replace dirty, polluting production processes and products with cleaner ones. In general, three types of measure are available to this end: the stick, the carrot and the sermon.

- The *stick* stands for discouraging polluting activities by internalising the environmental costs. Environmental taxes, levies, emission trading systems, setting and raising standards, as well as rules and prohibitions, are the best-known examples of such measures. Fines can be imposed for violations of rules that have been laid down.
- The *carrot* tempts producers or consumers to adopt the desired environmentally friendly behaviour. Subsidies, tax exemptions, pricing concessions, guarantees and loan facilities, but also preferential treatment through tenders and facilitating knowledge development and innovation policy are part of the repertoire of measures based on the carrot approach.
- Finally, the *sermon* responds to standards and values, and is related to the information and communication side of the policy mix. By informing producers and consumers about the consequences of their purchasing and user behaviour, it is possible to prompt them to adopt socially desirable behaviour. This involves concepts such as responsible business conduct and good citizenship.

The effectiveness of each of the above-mentioned measures in stimulating the circular economy depends on the specific circumstances, design and intended goals. This does not alter the fact that putting a price on negative societal effects is generally seen as an essential precondition for correcting market failure and promoting social prosperity.

Putting a price on negative societal effects is also helpful in obtaining funding for circular business models. Other obstacles to funding profitable circular business models are information asymmetry (financiers cannot make a good estimate of risks and returns), the lack of a track record, dependence on partners in the chain, and a lack of experience of new funding structures (e.g. the product-as-a-service model).

### **Possibilities provided by financial instruments**

The SER report divides the production and consumption chain into four phases:

1. Raw material extraction (mostly takes place abroad).
2. Processing of a raw material into a semi-finished product (material) and then into an end product (upstream and downstream).
3. End use of a product (including repair and reuse through second-hand market).
4. Waste phase (recycling of materials, incineration, landfill and dumping).

On the basis of this report, the SER notes that financial instruments, such as taxes, subsidies and public procurement, provided they are well-designed, can contribute effectively to speeding up the transition to a circular economy. In this process, it is important to consider the damage to the environment and the use of raw materials throughout the production, consumption and waste chain. For each of the four phases, possible financial instruments are identified that can reduce environmental damage and encourage more efficient use of raw materials, less waste and more high-quality reuse.

### **Phase 1: Financial instruments and raw material extraction**

As regards environmental damage and scarcity in relation to the extraction of raw materials in the Netherlands – principally sand and gravel – there is no immediate reason to structure (or restructure) financial instruments in order to promote the circular economy. The environmental damage resulting from extraction in the Netherlands is relatively limited and there appears to be no problem of scarcity. Any import duty on raw materials from abroad is only possible under European Union legislation.

### **Phase 2: Financial instruments in raw material processing and production**

In absolute and relative terms, the negative external effects of raw material consumption principally involve this phase and specifically the production of:

- materials such as basic plastics, other chemical products and materials, iron and steel, nitrogen for the artificial fertilizer industry, naphtha and bitumen;
- end products, such as petrol and diesel;
- buildings and other constructions.

The challenge is to deploy financial instruments in such a way that producers are induced to apply circular principles and to innovate as early as the phase of raw material processing and production. The key findings are set out in Table 1.

Table 1: Possible financial instruments in raw material processing and production

<i>Targeted input taxes</i>	Input tax is particularly effective in the production phase if it involves raw materials with negative externalities (environmental damage) that have been insufficiently priced or if risks to the security of supply arise (e.g. critical rare earths). The effectiveness will vary from one sector or chain to another. Furthermore, the basis for the tax and the tax rate are decisive for the effect. Various criteria are important for an effective regulatory tax: substitution possibilities, possibility of integration into the tax system (feasibility, readiness to comply and enforceability) and a gradual phasing in.
<i>Circular tendering</i>	Circular tendering is increasingly a central principle for all public authorities and government-related organisations. Here, public authorities play the part of launching customer. Through design contests and phased tendering procedures, public authorities challenge companies to work fast to find solutions to questions of circularity.
<i>Circularity and Top sector approach<sup>1</sup></i>	Government policy aims to focus what is known as the <i>Topsector</i> approach more strongly on three major social issues: energy transition/sustainability; agriculture/water/food; and quantum/high-tech/nano/photonics. It makes sense to base management of the revised <i>Topsector approach</i> on circular principles.
<i>Innovation subsidies for circular business operations</i>	The current design of generic innovation instruments fails to address properly the challenges of the circular economy. In such instruments, it is not really possible to take account of social innovation, new forms of cooperation in the chain, products with modular composition or innovative reuse, although these forms of innovation are of great importance for circular business operations. Broadening innovation instruments in this way is therefore desirable.
<i>Promoting application of secondary materials</i>	There is a successful subsidy scheme for funding the unprofitable top segment of renewable energy projects: the SDE+ <sup>2</sup> . Analogous to this operating subsidy, there is the possibility of investigating whether the same mechanism can be used to reduce (temporarily) the price difference between the relatively cheap primary raw material flows and the relatively expensive secondary flows.

### Phase 3: Financial instruments in the use of end products

In the use of end products by consumers and producers, the question is how government instruments can provide incentives for greater reuse through the second-hand market, repair, refurbishing and modernising an existing product. In addition, consumers have to be given incentives to buy products that cause less environmental damage or to buy fewer products, for example by shifting the focus from possession to the use of products. The government itself also consumes goods and services, and can therefore play a positive role in this area. Table 2 summarises the most important findings.

<sup>1</sup> Top sectors are areas in which Dutch businesses and research centres excel worldwide. Businesses, universities, research centres and the Dutch government work together on knowledge and innovation, internationalisation and human capital, and on reducing the regulatory burden in order to strengthen the country's position still further.

<sup>2</sup> The SDE+ (Stimulerende Duurzame Energieproductie) [*Promotion of Sustainable Energy Generation*] is an operating grant. Producers receive financial compensation for the renewable energy they generate.

Table 2: Possible financial instruments in the use of end products

<i>Environmental pricing of environmentally damaging products</i>	The current set of financial instruments provides various forms of product-specific environmental pricing by means of purchase taxes and taxes on use. A better understanding is needed of the opportunities and risks associated with product-specific purchase taxes for more product groups that cause significant emissions when used.
<i>Accessibility of subsidy schemes for circular companies</i>	Innovations within the framework of the circular economy can be supported by energy-saving and environmental conservation schemes, such as a tax benefit for the purchase of operating assets that contribute to closing the cycle and efficient use of raw materials. The question is whether the existing subsidy possibilities can be made more accessible for companies that want to apply more circular business operation practices.
<i>Use of buying power by government institutions</i>	Circular procurement by public authorities can be an important incentive for entrepreneurs to design products in a circular and modular fashion, so that the raw and other materials used can remain in economic cycles with maximum value retention.
<i>Temporary subsidies for circular innovations</i>	Temporary purchasing subsidies for circular innovations can be relevant if these innovations have not yet benefited from learning effects and upscaling effects or for as long as environmental damage is not priced or pricing is insufficient. For example, a temporary subsidy for the purchase of products with a modular design, which are simple to repair, refurbish or modernise, can prompt consumers to opt for longer-lasting products with a cradle-to-cradle design.
<i>From possession to use with less environmental damage</i>	A shift from possession to the use of products can lead to products being made and used in a smarter fashion, because this creates incentives for producers to manufacture products, or parts of products, that retain their value for as long as possible. As this does not always happen, the question is which product groups this applies to and in what way financial instruments can assist this shift from possession to use.
<i>Reduction in repair costs</i>	The costs of repairs can be reduced by means of targeted tax cuts, such as a reduced VAT rate for repair services. However, there are complications in implementing such a measure, as one has to determine which financial or other instruments can be designed in such a way that they encourage repairs, deliver net environmental benefits and are feasible.

#### **Phase 4: Financial instruments in waste processing and recycling**

At the end of a product's cycle of use, there should be a coherent package of measures to limit environmental damage in the waste processing phase. It is important here for generic financial instruments in the innovation policy also to give impetus to technological developments, so that recycling becomes cheaper and of higher quality. The instruments that can be used are given in Table 3.

Table 3: Possible financial instruments in waste processing and recycling

<i>Effective collection systems</i>	The variety of policy measures applied by municipalities in the Netherlands, together with the information available from statistics on waste, offer municipalities many possibilities for learning from one another and for measuring the effectiveness of different systems. Municipalities must therefore exchange knowledge in order to understand the effects of various forms of cost allocation in waste collection.
<i>Instruments to combat litter</i>	Deposit systems can help prevent litter and fly tipping. This is especially the case if a tax levy in the waste phase leads to socially undesirable evasive behaviour (fly tipping). The question is to what extent an expansion of the deposit system for packaging and other waste streams is needed in order to reduce the amount of litter.
<i>Preventing illegal dumping</i>	Pricing waste creates the risk that individuals and companies will engage in evasive behaviour and illegally dump certain waste

	streams. It is necessary to determine at which pricing level fly tipping becomes a substantial problem, making a pricing policy ineffective.
<i>Optimising waste processing</i>	In order to take steps towards a circular economy, one option is to price the environmental damage resulting from landfilling and incinerating waste. This is relatively simple to integrate into the system. For waste that contains hazardous substances, controlled landfilling or incineration of materials are the best options as far as the environment is concerned. The question is whether the environmental damage from landfilling and incineration can be taxed in such a way that subsequent separation becomes an interesting option.
<i>Environmental damage and useful application of waste</i>	It is important that any environmental damage caused by useful applications should be priced correctly. For example, the effects of applications of bottom ash are not known with any certainty. This leaves no room for exemptions, reduced rates or subsidies for the waste incineration plants under the waste disposal tax scheme due to the useful application of energy generation, including for biomass or sewage sludge. A better understanding is needed to determine how exemptions and reduced rates for incineration plants can be phased out, given the associated loss of incineration-based energy generation.

A general conclusion is that a number of measures are immediately applicable. At the same time, more knowledge is still needed in order to estimate properly the specific effects of financial instruments on various raw materials, chains and sectors. Central to this is the question of which design produces the intended efficiency gains and benefits for the environment, and what its side effects are. A follow-up question is whether accompanying policy is needed to minimise undesirable societal side-effects.

### **Accompanying policy**

If the policy option of taxation – or more intensive taxation – of raw materials is chosen, for example through an input tax, the first effect will be increased costs for companies that are big consumers of raw materials. To what extent these cost increases also raise prices for buyers (other companies in the chain and consumers) depends partly on the possibilities that the producing companies have for substituting materials; the share of the total operating costs represented by raw material and energy costs; and the market conditions that determine whether producers can pass on cost increases to their buyers. In the most extreme case, production will be stopped. There is often a delay before the effects are felt. As a raw material tax becomes more effective, tax revenue will decline if tax rates remain the same.

Accompanying policy to correct for undesirable side effects may relate to the competitive position of companies, job losses, and a loss of purchasing power of citizens.

#### *Competitive position of companies*

*Firstly*, the design of a tax measure is of great importance for the competitive position of companies. Focusing on an input tax, this means, for example, that in order to determine the tax rate, raw material-specific information is needed regarding substitution possibilities and price elasticity. If there are no possibilities for substitution, demand for the raw material in question will not be sensitive to a tax that increases prices. A gradual introduction with stepped increases in the tax rate could be desirable to help integrate the tax, so that when companies make investment decisions, they are able to anticipate the new situation and are given time to initiate necessary innovations and introduce products derived from those innovations. Moreover, a gradual introduction obviates the need for exemptions.

*Secondly*, it must be ensured that Dutch companies in energy-intensive and resource-intensive sectors that are global leaders in terms of efficiency and environmental impact do not lose out to the competition of foreign, less efficient competitors due to higher

costs. It is then important to compensate leading Dutch companies.

*Thirdly*, from a dynamic perspective, a well-designed package of measures can improve the competitive position of leading companies. An example of this 'first mover' effect is the way in which the contamination of surface water has been tackled in the Netherlands with a mix of measures. In addition to levies, the package of measures consisted of innovation subsidies, technology support and knowledge exchange.

#### *Effects on employment*

The idea that regulatory taxes can be used to reduce labour costs and thus benefit employment is not supported by the literature. For example, additional regulatory taxes may lead in the short term to negative changes to production and thus negative effects on employment. This is in contrast to employment growth in other sectors of the economy. In the long term, the economic models show no significant employment effects in quantitative terms. Follow-up research focusing on specific regulatory levies is needed to gain a clearer picture of the effects on production and employment in the short and medium term.

#### *Loss of purchasing power*

The extent to which citizens experience a loss of purchasing power due to the taxation of raw materials will be strongly dependent on the price effects of the end products and whether and how these are passed on to the consumer. Recent research indicates that in the Netherlands these price effects will probably be limited. A fictitious levy of 10 per cent on all natural raw materials would increase the average price of domestic consumption expenditure by about 0.5 per cent. Of course, the price effect will vary between consumer goods and the purchasing power effects will be different for different income groups. On the other hand, extending the life of appliances and a wider range of sharing services will lead to cost savings. For the sake of the social acceptability of the transition to a circular economy, it may therefore be necessary to compensate citizens for their loss of purchasing power.

#### **In conclusion**

This report has identified the criteria for the use of financial instruments that can stimulate the circular economy. A number of financial instruments are effective and can be integrated in the short term. Examples of such instruments include circular tendering and procurement by governments and related organisations, the use of circularity as one of the basic principles of the new mission-driven top sector policy, and a broadening of innovation subsidies, which gives circular business operations a boost. The good news is that these instruments are being increasingly firmly embedded in policy.

For most financial instruments, more focused research is needed, concentrating on both the most effective design and the extent to which the intended effect actually occurs. This partly concerns the design and criteria for the effective use of possible taxation measures such as an input tax, purchase or use taxes on end products or the pricing of waste. The effectiveness will vary from one sector or chain to another. Furthermore, the basis for the tax and the tax rate are decisive for the effect. In addition, the study contains various research questions about the effectiveness of other financial instruments.

As well as accompanying policy, connections with other policy areas are also important for a comprehensive policy assessment. For example, there is a clear connection between the transition to a circular economy and the energy transition. Reducing consumption of raw and other materials, combined with an emphasis on recycling and reuse, will lead in many cases to less environmental damage in the form of CO<sub>2</sub> emissions, because less energy will be needed for the production process. Furthermore, new energy technologies are often very dependent on critical rare earths that are only extracted and available in a limited number of places in the world, resulting in risks for the security of supply. This is the case, for example, for the manufacture of wind turbines, but also for electric cars. A point of concern for purchasing and operating

subsidies in the context of the energy transition is therefore that opportunities for recycling and reuse should also be taken into account.