

## Summary by the study

# Doing justice to climate change

### Background

In a landmark verdict in the lawsuit filed by the Urgenda Foundation, on 24 June 2015 the district court of The Hague ruled that by 2020 the State of The Netherlands must reduce the country's greenhouse gas emissions by 25% relative to 1990. Several weeks later, on 1 September 2015, the Cabinet announced to Parliament that an immediate start would be made with implementing the court's ruling.

In a letter to Parliament dated 9 April 2016 (Rijksoverheid, 2016) the Cabinet announced a series of policy measures deemed sufficient to meet the terms of the ruling. While the (concrete) measures lead to a significant reduction in carbon emissions, they are still insufficient to achieve the specified target. The present study therefore addresses the following three questions:

1. What gap remains in efforts to secure the 25% CO<sub>2</sub> reduction target in 2020, once the measures cited in the Cabinet's response have been implemented?
2. What is the most cost-effective policy package to bridge this gap?
3. What will this cost the average household?

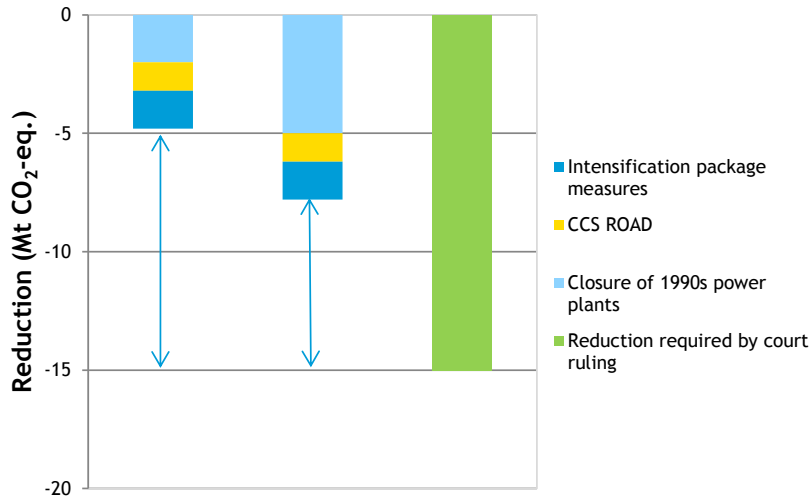
### There is still a 7 to 10 Mt gap in securing the Urgenda target

In its formal response the government outlined a series of measures deemed sufficient to comply with the court's ruling, including closing power plants built in the 1990s and implementing the so-called 'intensification package' for securing the targets set out in the Energy Agreement for Sustainable Growth. The carbon cuts deriving from these measures are less than those embodied in the government's earlier announcement of 9 April 2016 (Rijksoverheid, 2016), because the instrumentalized policies in the intensification package are still not enough to secure all the targets set out in the Energy Agreement. Our estimate of the carbon cuts resulting from the intensification package is grounded in a review by the Netherlands Energy Research Centre (ECN, 2016)<sup>1</sup>. There still remains a gap of 7 to 10 Mtonnes before the Urgenda target is achieved.

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<sup>1</sup> ECN, 2016. *Beoordeling intensiveringspakket Energieakkoord*, Amsterdam: ECN, Policy Studies. This analysis shows that the instrumentalized policies in the intensification package lead to generation of around 8 PJ additional renewable energy and annual energy savings of 16 PJ relative to the 2015 National Energy Outlook (NEV). Using the emission indices employed in the IBO report (Rijksoverheid, 2016) we converted these values to CO<sub>2</sub>-equivalent reductions. This yielded an emission reduction of 1.6 Mt rather than the figure of 6.5 Mt cited in the government's response.

Figure 1 Remaining gap (Mt CO<sub>2</sub>-eq.)

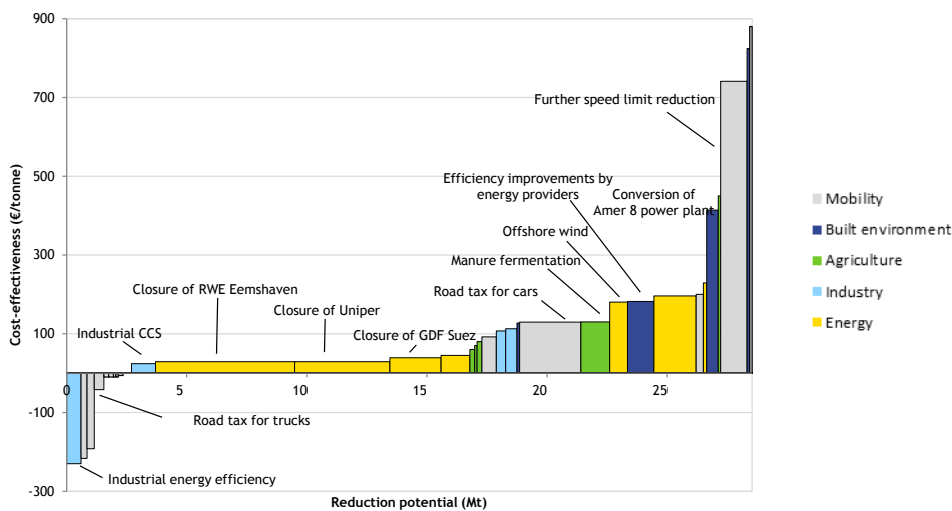


\* Although the need for additional measures in transport, agriculture and the built environment is cited, such measures were not specified in concrete terms, nor the implied emission cuts quantified.

### With the most cost-effective package the Urgenda target can be secured at no net cost to society

To bridge the remaining gap, a variety of measures are available. The national cost curve for measures that can be implemented by 2020 is shown in Figure 2, in which the X-axis represents the cumulative reduction potential and the Y-axis the cost of the measures in euros per tonne.

Figure 2 Cost of CO<sub>2</sub> abatement measures (euros per avoided tonne CO<sub>2</sub>-eq.)



As Figure 2 shows, around 3 Mt emission cuts are achievable with measures that come free of charge or even yield a profit: 9 PJ energy efficiency improvements by industry (0.6 Mt), behavioural measures in transport (1.8 Mt) and measures in agriculture and targeting other greenhouse gases (0.3 Mt). Following implementation of the cost-effective measures, Carbon Capture and Storage (CCS) in industry and decommissioning of one or two new coal-fired power plants are the cheapest measures (of those with a positive price tag) to close the gap in securing the Urgenda target by 2020.

Table 1 lists the measures making up the most cost-effective policy package.

**Table 1 Most cost-effective policy package for achieving the Urgenda target by 2020**

Sector	Measure	Costs (€ per ton saved CO <sub>2</sub> -eq.)	Reduction potential (Mt)	Annual costs (€ mln)
Industry	Energy efficiency in industry (9 PJ)	-230	0.6	-140
Transport	Lowering of untaxed business travel allowance	-217	0.3	-51
	Efficiency improvements, trucks	-192	0.3	-61
	Kilometre charge, trucks	-42	0.4	-19
	'Eco-Routing'	-6	0.2	-1
	'Eco-Driving'	-10	0.2	<0
	Traffic-light measures	-10	0.2	<0
	Teleworking	-10	0.1	<0
	Video-conferencing	-10	0.1	<0
Agriculture/other GHG	Longer productive life of dairy cattle	0	0.1	<0
	Reduced N <sub>2</sub> O in caprolactam production	1	0.3	0.2
Industry	CCS by industry	24	1.0	24
Energy	Closure of RWE Eemshaven	29	5.8	170
	Closure of Uniper (MPP3 plant)	29	4.0	115
<b>Total</b>			<b>13.5</b>	<b>&lt;40</b>

Table 1 shows that by decommissioning two of the three new coal-fired power plants in addition to the two coal plants built in the 1990s, an emissions reduction of 13.5 Mt is feasible at a total national cost of less than € 40 mln. If just one new coal plant is decommissioned, the net national cost is minus € 70 mln (achieving 9.5 Mt reduction). In other words, the policy package can be implemented at no net national cost<sup>2</sup>.

### **An alternative policy package to secure the Urgenda target costs € 400 to 600 million more per annum than the most cost-effective package with closure of new coal-fired power plants**

The most cost-effective package involves shutting down wither one or two new coal-fired power plants, depending on the precise figure in the cited range of the gap. However, in its response to the IBO report (see footnote 1) the government's states there is no intention of closing the new coal plants. This means that more expensive measures in the cost curve are needed to bridge the remaining gap in the Urgenda target for 2020. To achieve emissions cuts

<sup>2</sup> The notion of 'national costs' refers to the balance of costs and benefits, regardless of the parties in the Netherlands to which these accrue. From a national perspective, energy efficiency yields the greatest financial benefits, even if these require charges and/or subsidies. For certain parties there will be benefits, for others losses.

comparable with those resulting from closure of one new coal-fired power plant requires the following measures:

- reduction of methane slip in cogeneration gas engines;
- use of nitrification inhibitors;
- improved dairy cattle feed;
- 10% biofuels;
- biomass for district heating;
- biosteam in industry;
- CCS ROAD (Rotterdam CCS demonstration project);
- private homes from energy label G and F to E on ownership transfer;
- kilometre charge for passenger cars.

These measures lead to carbon emission cuts of a similar magnitude to closure of one new coal plant. The total national cost of these alternative measures is about € 400 mln per annum more than the most cost-effective policy package.

To secure the top end of the range of the remaining gap (see Figure 1) without closing two of the new coal plants, the cited measures would need to be augmented by compulsory (single-source) manure fermentation and an additional offshore wind farm, these being the most cost-effective alternative measures for guaranteed closure of the widest gap. The national cost of this package is around € 600 mln per annum higher than that of the most cost-effective package (including closure of the two power plants).

### **The cost per household is € 50 to 80 per annum higher if the Urgenda target is achieved without closing the new coal-fired power plants**

Certain carbon abatement measures will impact directly on household budgets, as with a higher pump price in the case of mandatory 10% biofuels, a higher ODE Renewable Energy Charge and energy-label measures for private homes. Costs may also knock on indirectly to private consumers, if industry passes on additional expenditures to households or if the government opts to compensate the costs of measures in specific sectors (as with improved dairy cattle feed) by raising taxes on private households. Because the precise (financial) consequences of the measures are as yet unknown, the additional burden for the average household can be only approximately estimated. If it is assumed that costs are passed on to households in their entirety, the annual price tag on a policy package with no closure of coal-fired power plants is around € 50 to € 80 per household higher than the most cost-effective package.

### **Only climate gains within the Netherlands**

The point of departure of this study is realization of the terms of the legal ruling in the Urgenda case, i.e. a 25% emissions reduction by 2020. This figure relates solely to emissions within the Netherlands. If the coal plants are shut down, the resultant reduction in CO<sub>2</sub> emissions will accrue largely from the generating profile of imported electricity. While this means a reduction in emissions on Dutch territory, these gains may well be partly offset by increased emissions abroad. The climate gains on balance have not been considered in the present study.



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