



Planbureau voor de Leefomgeving

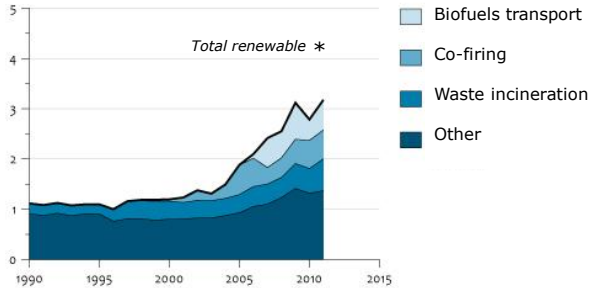
Bioenergy in the Netherlands, now and in the future



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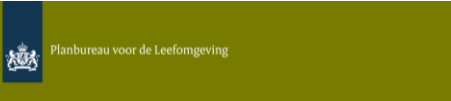
Bioenergy in the Netherlands

% of total energy use



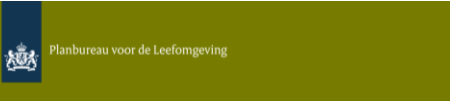
Bron: CBS.

CBS/jul12/0385
www.compendiumvoordeleefomgeving.nl

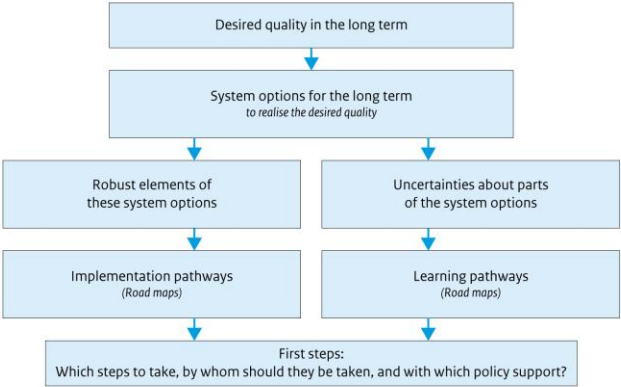


A sustainable energy system in the Netherlands on the long term:

- Clean
- Affordable
- Reliable



Methodology of backcasting and steps to follow





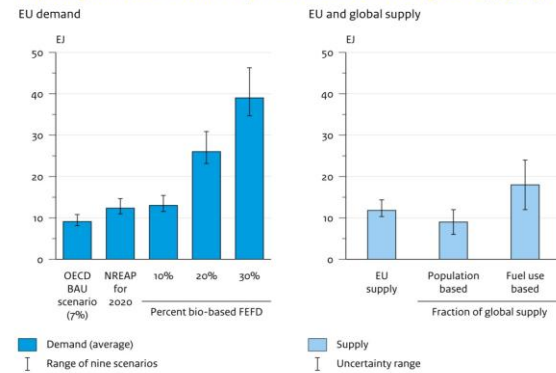
Biomass: future supply

- Sustainable? Land use
- Feasible? Degraded land, algae
- Sensible? Other applications

Global: 150 (- 400 EJ)
 Dutch share: 285 (- 760 PJ) *per capita*
 735 (- 1960 PJ) *per unit BNP*
 Dutch production: circa 200 PJ

A sustainable biobased economy in Europe in 2030

EU primary biomass demand versus potential sustainable EU and global supply, 2030





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Feasibility of 80% reduction in greenhouse gas emissions, by 2050

Energy demand compared to the reference image		-30%	-20%	-10%	-0%
Supply stocks and implementation space	Ample	+	+	+	+
	Moderate	+	+	?	?
	Limited	-	-	-	-

- + Feasible
- ? Feasibility uncertain
- Unfeasible



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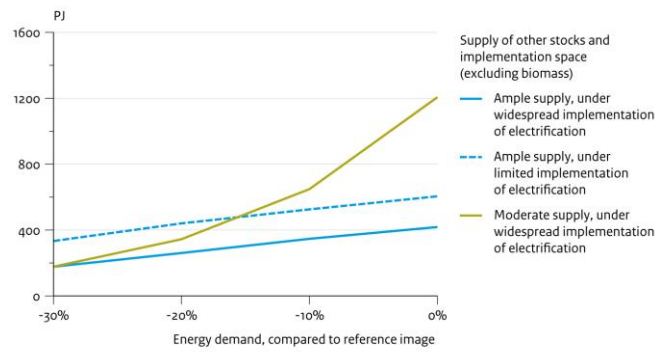
Feasibility of 80% reduction in greenhouse gas emissions, without application of biomass, by 2050

Energy demand compared to the reference image		Under widespread implementation of electrification			
		-30%	-20%	-10%	-0%
Supply stocks and implementation space	More than ample	-	-	-	-
	Ample	-	-	-	-

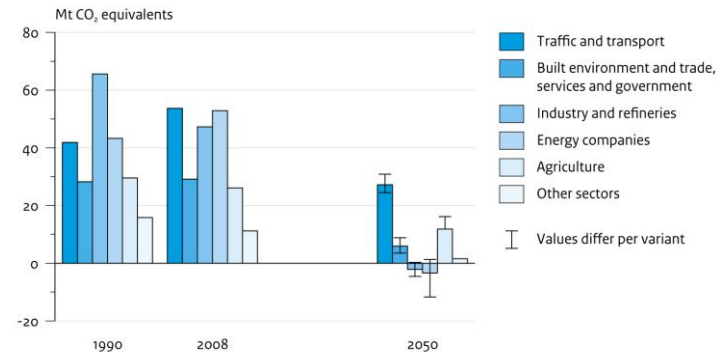
- + Feasible
- ? Feasibility uncertain
- Unfeasible

The need for biomass in the future energy system

Biomass demand, 2050



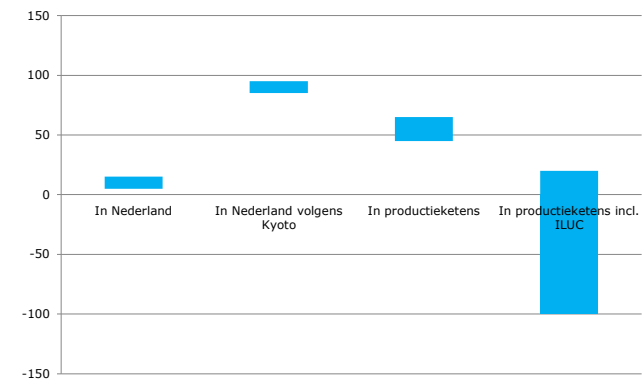
Greenhouse gas emissions per sector



What are the real emissions of biofuels? considering:

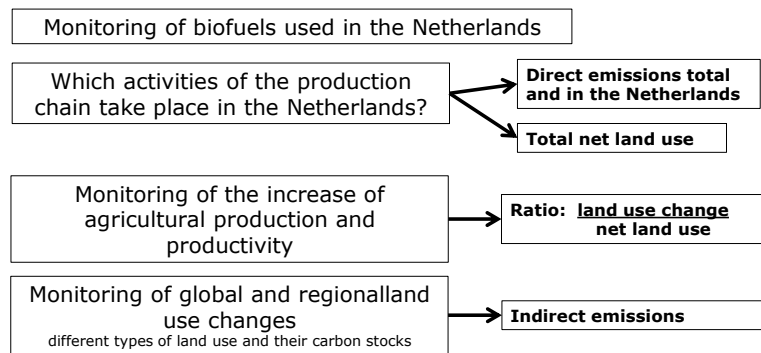
- Emissions in the production chain outside of the Netherlands
- ILUC-emissions
- Carbon debt

GHG-emission reduction (%) of biofuels used in the Netherlands in 2011

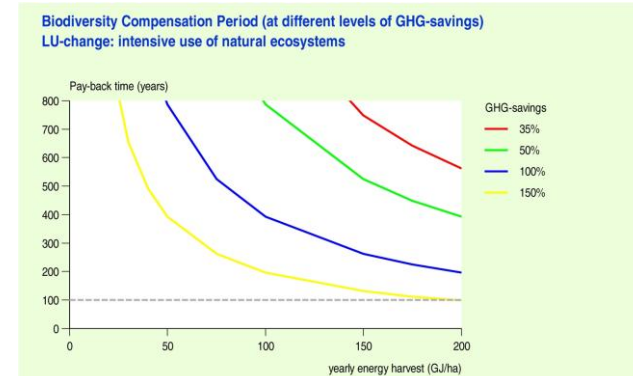




Method to assess ILUC-emissions

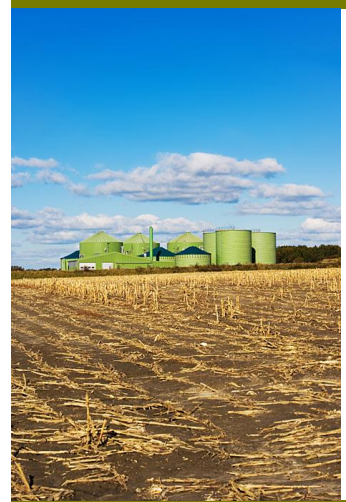
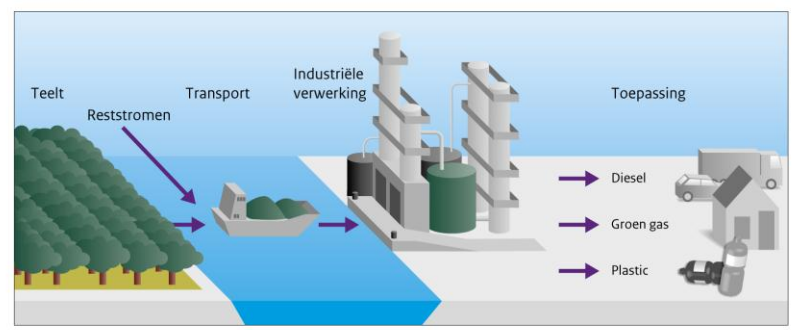


Impact on biodiversity



Innovation pathways: steps to take on the short term

Bio-energie



Questions ?