

Biobased investment climate in the Netherlands and Europe

Summary results quick scan

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You might also be interested in:

<http://www.industrialbiotech-europe.eu/>

<https://www.tno.nl/downloads/Biobased%20economy.pdf>

Introduction

- › The Dutch government wants to provide a fertile investment climate for innovative companies with biobased ambitions. Therefore, the ministry of Economic Affairs has asked TNO to conduct a 'quick scan' assessment.



Source picture:
www.5barg8.com

- › The following questions are central in this quickscan:
 1. Which **criteria determine the outcome** of planning biobased investment decisions?
 2. What is the **relative country performance** within and outside Europe?
 3. What are the **specific barriers** for investing in the Netherlands and Europe?

Approach & Scope (1/2)

Top-down
Literature
&
Interviews
(N=5)

- Identify investing factors
- Country performance

Europe



- Identify investing factors
- Country performance

USA,
Brazil



- Identify investing factors
- Country performance

Thailand



Bottom-up
Interviews
(N=12)

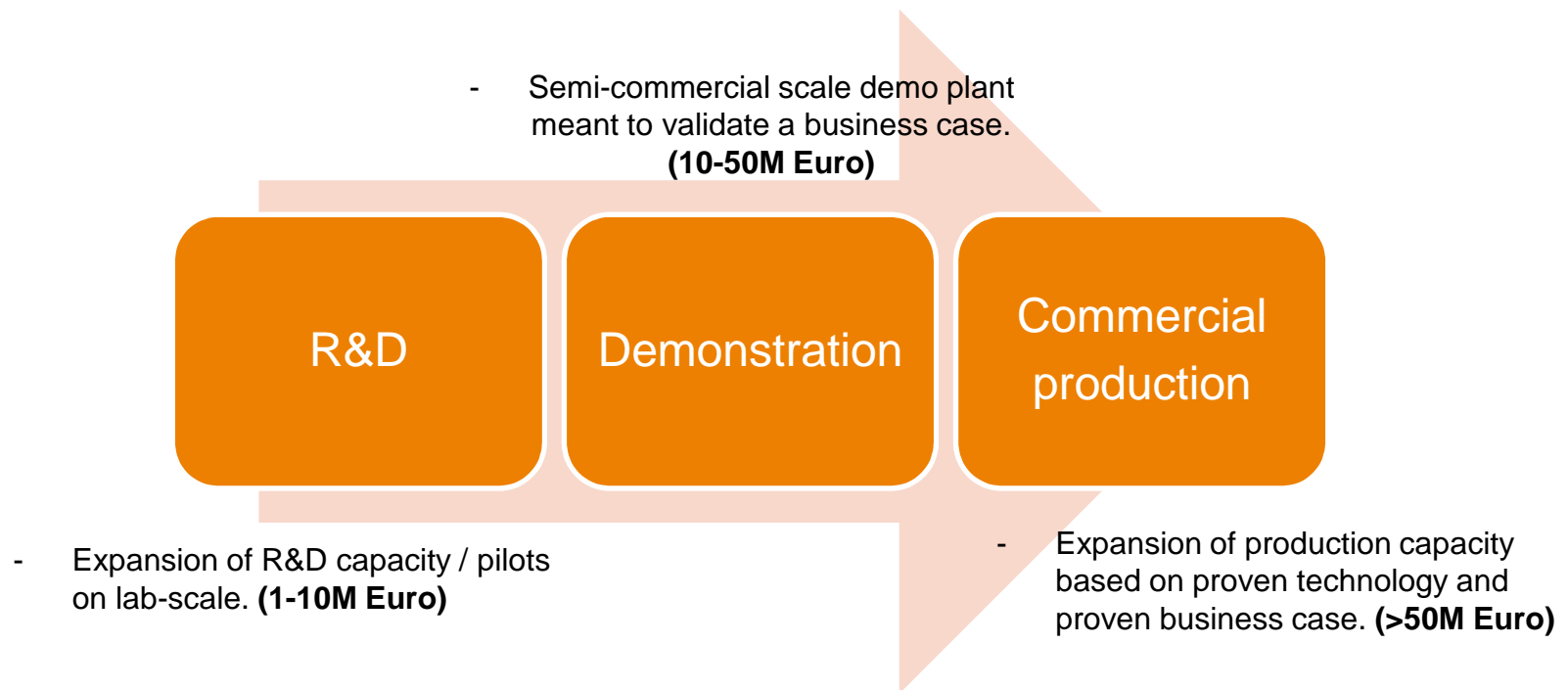
- Experience of biobased entrepreneurs
- Concrete drivers and barriers as experienced

The Netherlands



Approach & Scope (2/2)

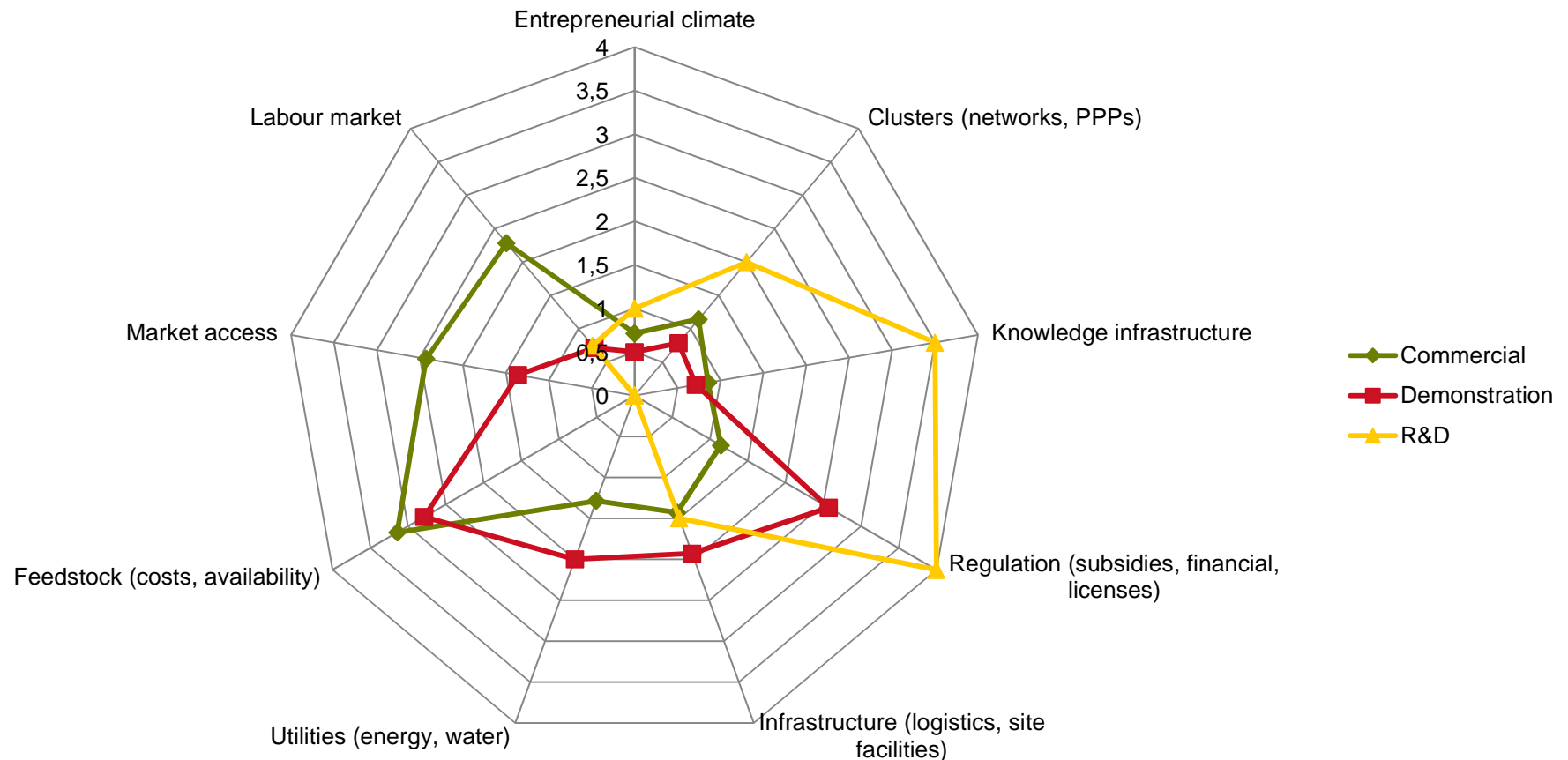
Differentiaton across the 'innovation funnel'



Focus on biobased chemical companies

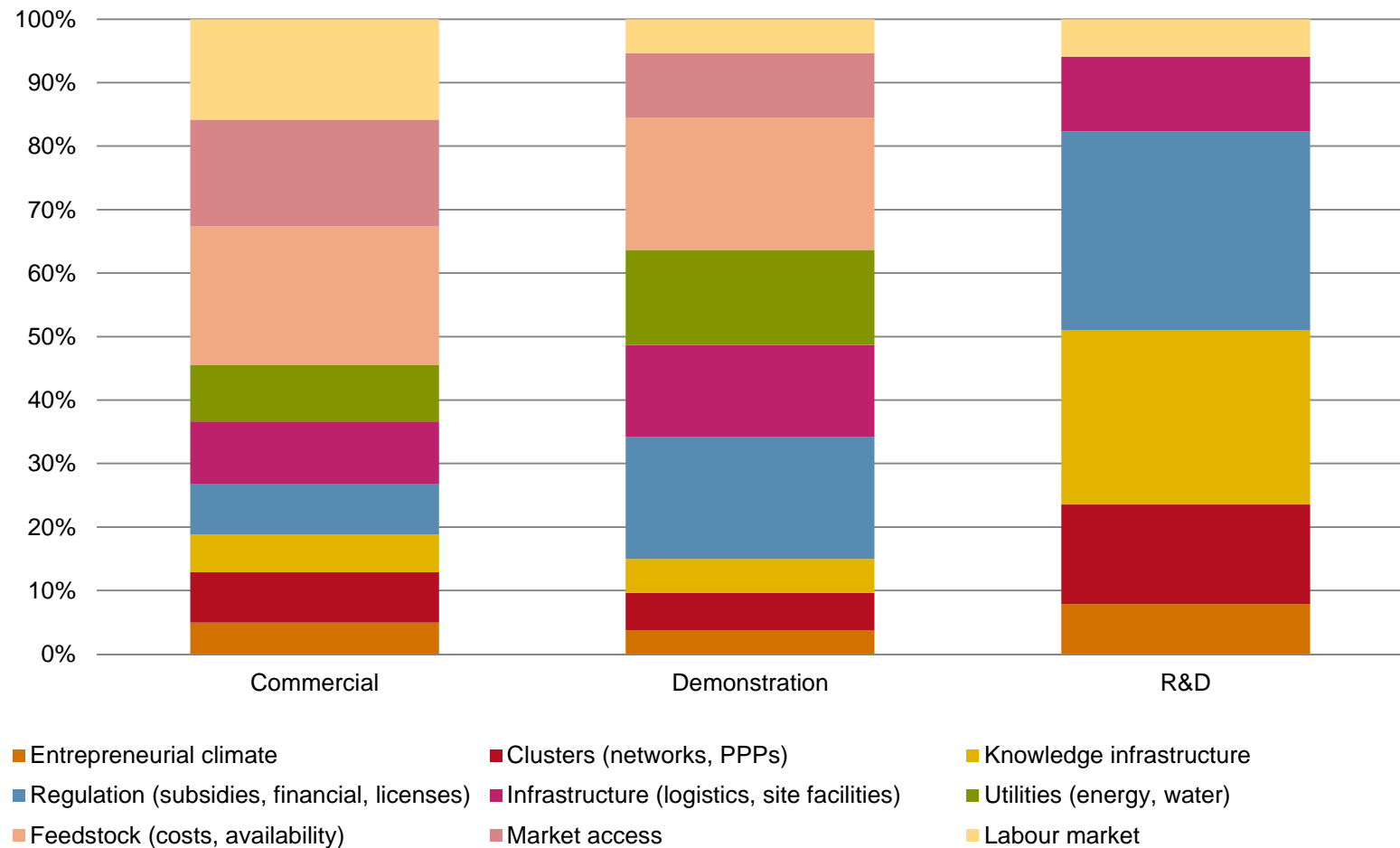
- › Excluding companies that exclusively produce bioenergy and biofuels.
- › Excluding companies that exclusively produce feed and food.

Criteria determining biobased investment decisions (1/2)



For each type of investment the figure shows the **average weight of each criterion considered** for deciding on a go/no-go and/or choosing a location. Weights are calculated on the basis of a collection of 'top 5' rankings. A weight of 5 stands for an average rank score of 1; a weight of 1 stands for an average rank score of 5; a weight of 0 means absence from any individual top 5).

Criteria determining biobased investment decisions (2/2)



This graph shows the **relative weight of the criteria considered** when making investment decisions with respect to go/no-go or location. Like for the previous figure, weights are calculated on the basis of a collection of 'top 5' rankings.



R&D capacity / pilot plants

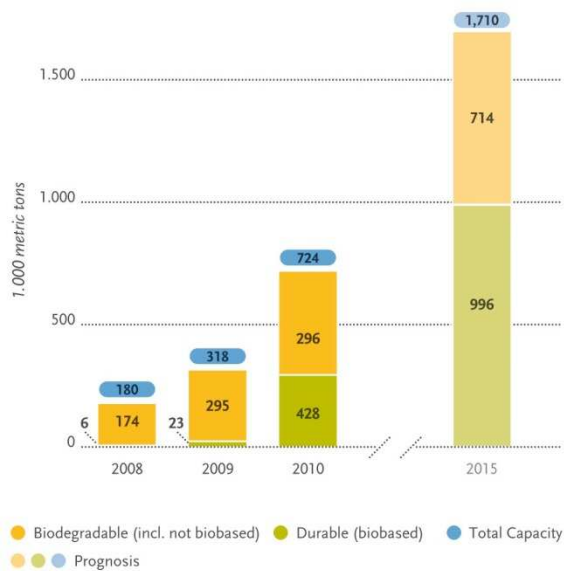
- › Generally speaking, investments are drawn to regions where professionals with the relevant knowledge are situated.
- › The knowledge infrastructure, in terms of organisations, facilities, education is key in attracting and supporting these professionals.
- › Public financing (i.e. subsidies) are a lifeline for biobased pre-competitive R&D.
- › Biobased clusters are important for their network effects, pilot facilities and especially for their 'marketing power'.

Demonstration plants / semi-commercial

- › Access to sufficient quantities of biomass feedstock at predictable and affordable costs is a requirement.
- › Investors seek to minimise high costs and risks associated with this stage. Policy support is crucial in most cases.
- › Investors look for a fit with the existing site infrastructure (e.g. steam supply, heat outlet, logistics, safety services).
- › Energy costs are a cost determining factor in the (bio) chemical industry.



Global production capacity of bioplastics



Source: European Bioplastics | University of Applied Sciences and Arts Hanover (Status May 2011)



Commercial production / Upscaling

- › Policy is of minor importance as the business case is leading.
- › Access to biobased markets is becoming more important. Whether this affects a location decision depends on type of product and company.
- › Labour market conditions (e.g. costs and quality of operators) are key.
- › Feedstock, infrastructure and energy costs remain important criteria.

Country comparison

EU weaknesses

- Feedstock costs and security of supply
- Energy costs
- Tax pressure / lacking financial incentives
- Lack of 'valley of death' capital

EU strengths

- R&D support (subsidies / policies)
- Knowledge infrastructure
- Logistics infrastructure (port / inland)
- Emerging biobased niche markets

Within Europe differences are relatively small

	Europe				N-America	S-America	Asia	
	NL	BE	DE	FR	VS	Brazilië	Thailand	China
Feedstock: costs and availability	-	-	-	-	++	++	++	?
Utilities: energy costs	-	-	-	-	++	+	+	++
Infrastructure: logistics	++	++	+	+	+	+	+	+
Knowledge infrastructure	++	++	++	++	++	?	?	?
Regulation: R&D support	++	++	++	++	++	?	?	?
Regulation: incentives / taxes	-	-	-	-	+	?	++	++
Entrepreneurial culture	+	?	-	+	++	?	?	?
Market access / demand	*	*	*	*	*	*	*	*

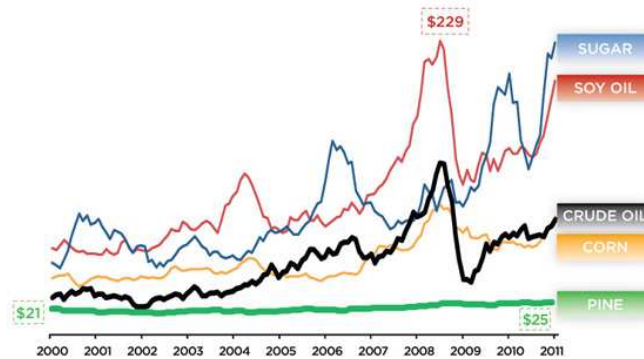
Country comparison of key decision making criteria for allocating of biobased investments.

? Unknown / Ambiguous

* Company or product specific

Zoom in: feedstock costs

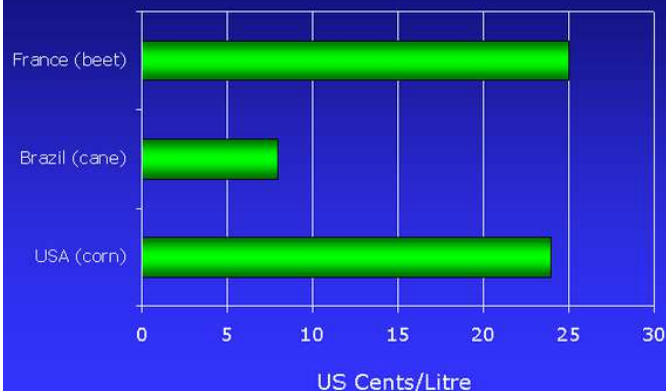
FEEDSTOCK COST
DOLLARS PER BARREL OF OIL EQUIVALENT



SOURCES: TIMBER MART-SOUTH, EIA, USDA, INTERNATIONAL MONETARY FUND, PNHL
HYDROGEN RESOURCE CENTER, KIOR ANALYSIS

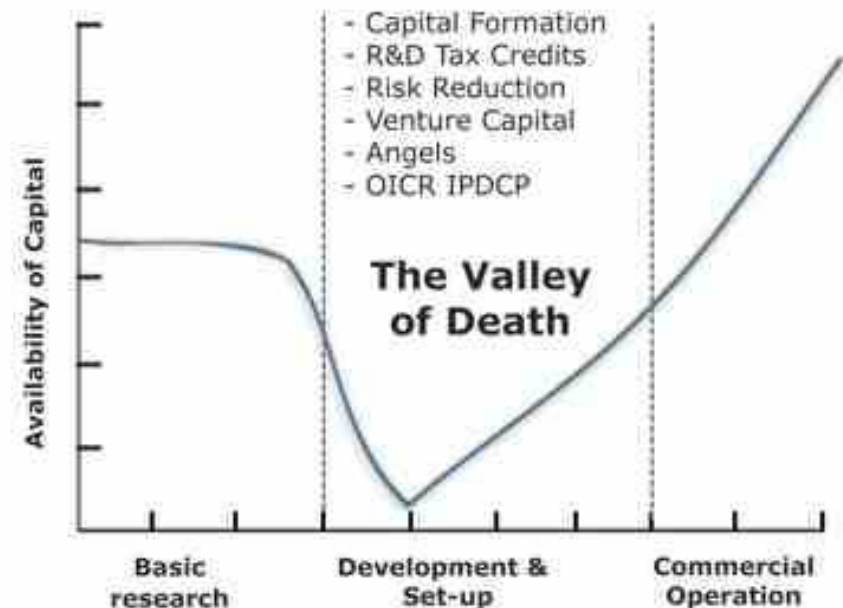
- › Wood prices (**chips, pellets**) in the EU are about three times higher than in the USA.
- › Cost levels in the EU are modest where **wood residues** can be collected and transported over short distance. Still the prices are volatile.
- › Global prices of **sugar** are currently highly volatile. Potential for upscaling sugar production seems to lie especially in Brazil and SE Asia.

Gross Feedstock Cost Per Litre Of Ethanol



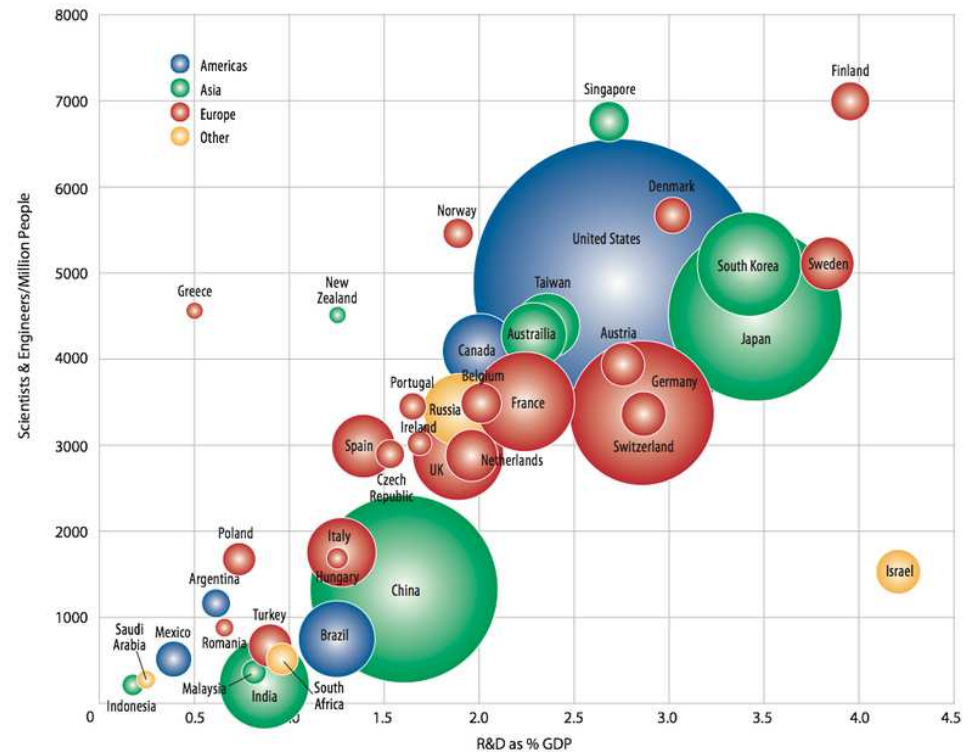
Zoom in: policy incentives

- › A key strength of EU is the policy support for R&D.
- › The EU has trouble supporting companies in bridging the 'valley of death'.
 - › Tax levels are relatively high
 - › Lack of demand-side policies / public procurement initiatives
- › Licensing is important for choosing specific locations within a country, but only all other business requirements have been met.



Zoom in: knowledge infrastructure

- › The USA and the EU are globally considered leading in biobased R&D.
- › Growing competition is to be expected from China and Brazil.
- › Note that important differences do exist between EU countries.
- › The figure provides a crude estimation of strengths in terms of R&D spending in general (not specific for biobased).

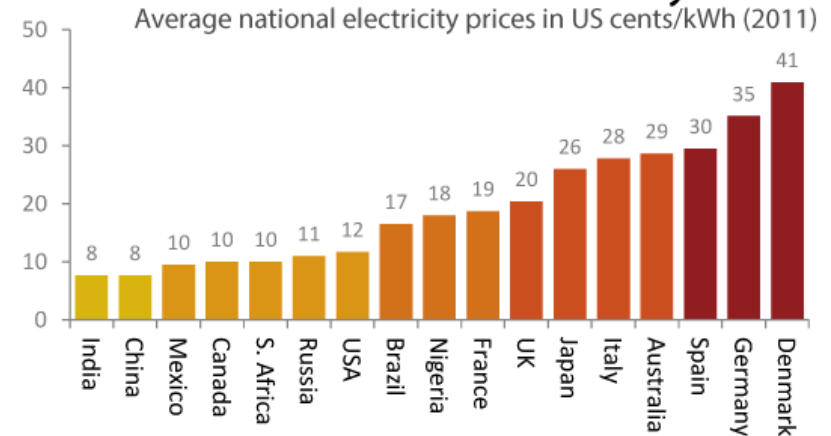


Global R&D spending 2011. Size of circle reflects the relative amount of annual R&D spending by the country noted. Source: 2012 Global R&D Funding Forecast.

Zoom in: Energy costs

- › Energy prices are lowest in China and the USA.
- › For the EU, energy prices are relatively high. Within the EU price differences are less significant.
- › Cheap energy on the basis of coal (China) and shale gas (USA) comes with high ecological costs. Some biobased businesses consider this a liability.

How much does electricity cost?

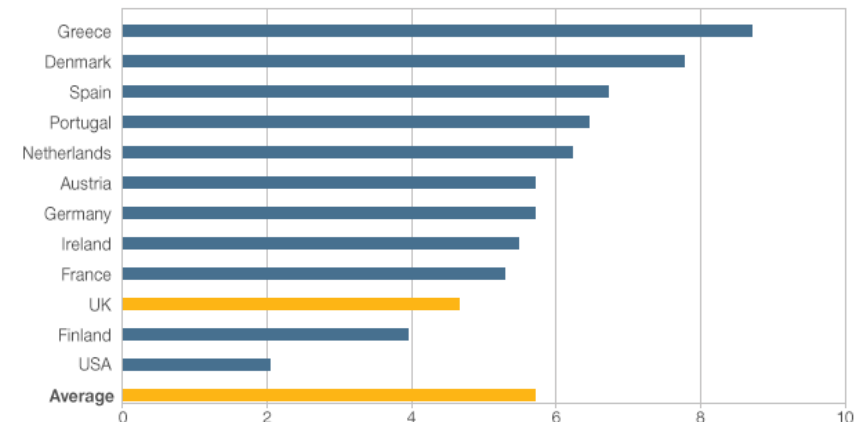


Data: average prices from 2011 converted at mean exchange rate for that year

Sources: IEA, EIA, national electricity boards, OANDA shrinkthatfootprint.com

Comparing the price of gas in the EU 15 and USA, 2012

Prices inc taxes, pence per kWh



No data on: Belgium and Luxembourg
Source: Ofgem

Important barriers experienced for the Netherlands (1/2)

High feedstock costs / availability

- › Subsidies for bioenergy seem to create artificially high prices for biomass
- › Lack of incentives for farmers to innovate
 - › e.g. sugar quota
- › Regional biomass supply is insecure
- › Waste legislation is not adapted to circular economy concept

Lack of 'valley of death' capital

- › Lack of risk capital
- › Lack of government procurement programmes
- › Conditions of government financing are often unfit for commercial parties:
 - › Obligation to form consortia
 - › Obligation to disclose knowledge

Important barriers experienced for the Netherlands (2/2)

Limited market value biobased products

- › Lack of market incentives for biobased products
- › Limited consumer awareness of (advantages of) biobased products
- › No level playing field for fossil and biobased applications

Burden of regulation

- › REACH requirements press on biobased businesses (especially SMEs)
- › Permit procedures (province, municipalities) take too much time

Fragmentation and lack of critical mass

- › Biobased initiatives are spread too thin
- › Lack of cooperation between regions
- › Lack of international cooperation across Europe

Finally: some issues for discussion

- › In the face of international competition, what role is there for a European biobased chemical industry? Which businesses in the Netherlands are part of that?
- › Which possibilities are there for strengthening the position of European feedstock producers? Which role is there for Dutch forestry, agriculture and waste processors?
- › How can the Dutch and EU governments mitigate the risks of biobased investments, most importantly for the support of demonstrations plants?
- › Which possibilities are there for developing biobased markets within Europe and the Netherlands? How to stimulate consumer uptake of biobased products?