Transport Fuels - a Changing Landscape

What about Low-Carbon Fuels?

studio Gear Up

7 October 2015

UPEI General Assembly, Edinburgh

NISSAN

Innovation that excites

EEN ACTIERADIUS TOT 250 KM EN 2 JAAR ONBEPERKT SNELLADEN? CHECK!

zero Emission

but zero emission…?

2 years free charging

250 km EV range

Wij zijn geen nieuwkomer in de wereld van elektrische auto's. Dus wij hebben de tijd gehad om zaken door te ontwikkelen, zoals een nieuwe 30 kWh batterij die u in staat stelt verder te gaan tussen twee oplaadbeurten, tot wel 250 kilometer*. Over opladen gesproken; tijdelijk krijgt u bij een nieuwe Nissan LEAF gratis 2 jaar onbeperkt snelladen bij alle Fastned stations **. Kijk op nissan.nl/leaf voor meer informatie.

How to act on such a development?

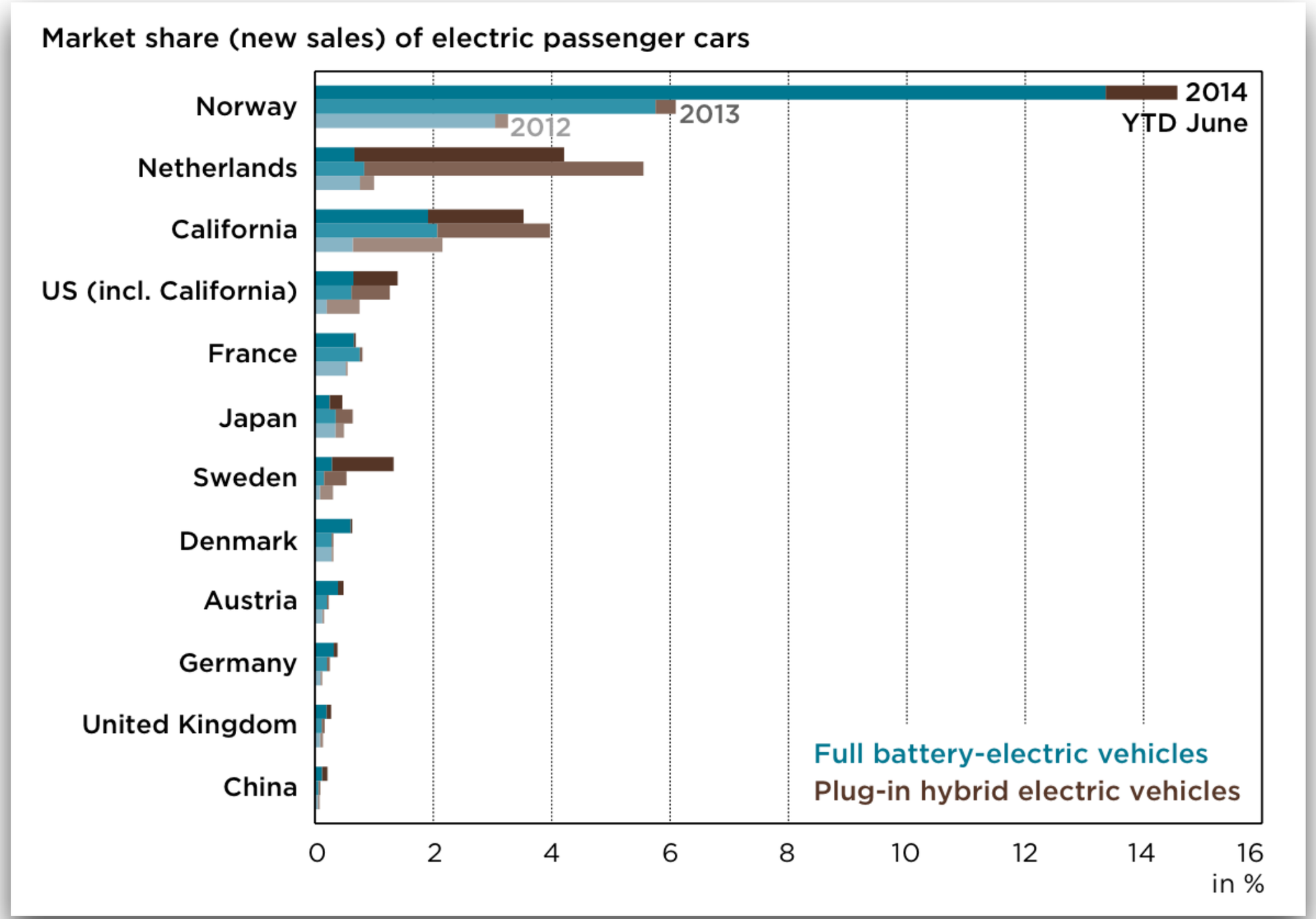
100% ELEKTRISCHE NISSAN LEAF. CHECK!

MAAK DE WERELD ELEKTRISCH

*250 km o.b.v. NEDC-cyclus. Gemiddeld rijbereik in de praktijk variërend van 125 tot 200 km, afhankelijk van weg- en weercondities en rijstijl. ** Aanbod geldig bij aanschaf van een nieuwe Nissan LEAF MY2016 in de periode 15 september t/m 31 oktober 2015, niet inwisselbaar tegen contanten en niet geldig in combinatie met andere acties.

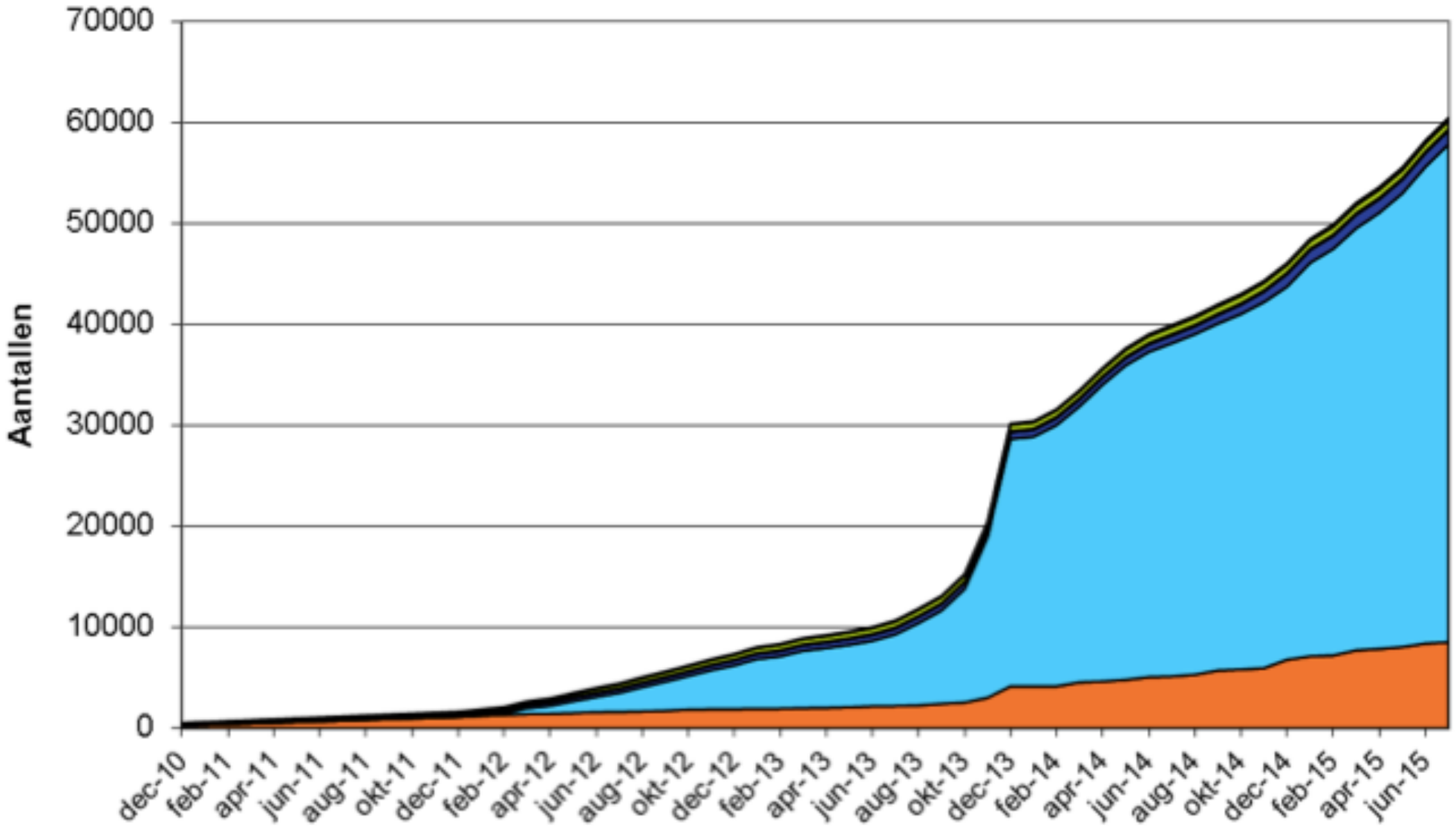
Let’s take the example of the electric vehicle market in the Netherlands

Where do electric vehicles enter the markets?



Source: ICCT, 2015 - European Vehicle Market Statistics - Pocketbook

How is the EV-portfolio in the Netherlands progressing?



Plug-in Hybrid EVs

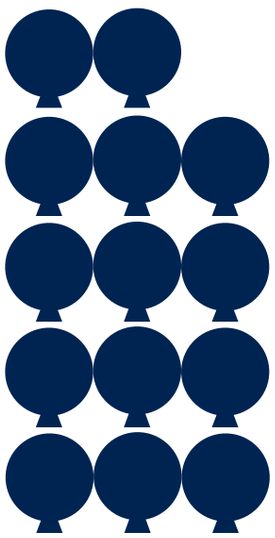
Battery EVs

Source: RVO, 2015

How do they perform on GHG-saving?

Let’s have a look at the situation by end of 2014

7k Battery EVs and 37kPHEVs on Dutch market.
If all of their ‘electric’ kilometers were fossil based, that would have resulted in 136 ktonne $CO_{2\text{-eq}}$ emissions.

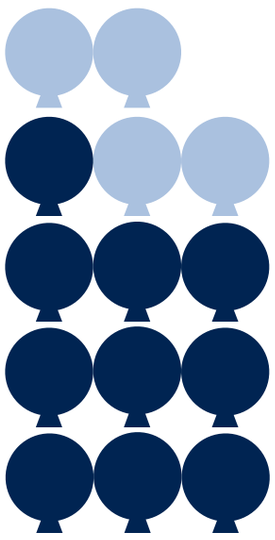


= 10 ktonne $CO_{2\text{-eq}}$ emission

Let’s have a look at the situation by end of 2014

7k Battery EVs and 37kPHEVs on Dutch market.
If all of their ‘electric’ kilometers were fossil based, that would have resulted in 136 ktonne $CO_{2\text{-eq}}$ emissions.

Due to use of electricity about 42 tonne $CO_{2\text{-eq}}$ emissions was avoided.
[Assumption is that PHEV run 50% of km’s on electricity]



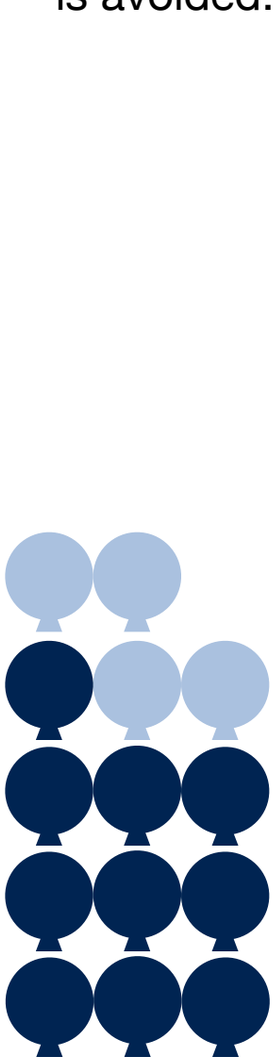
= 10 ktonne avoided $CO_{2\text{-eq}}$ emission

= 10 ktonne $CO_{2\text{-eq}}$ emission

Let’s have a look at the situation by end of 2014

590 Thousand m^3 biofuels are used in the Dutch market.
If the corresponding amount of energy was fossil based, it would have resulted in 1,3 million tonne $CO_{2\text{-eq}}$ emissions.

Due to use of biofuels about 907 ktonne $CO_{2\text{-eq}}$ emissions is avoided.



= 10 ktonne avoided $CO_{2\text{-eq}}$ emission

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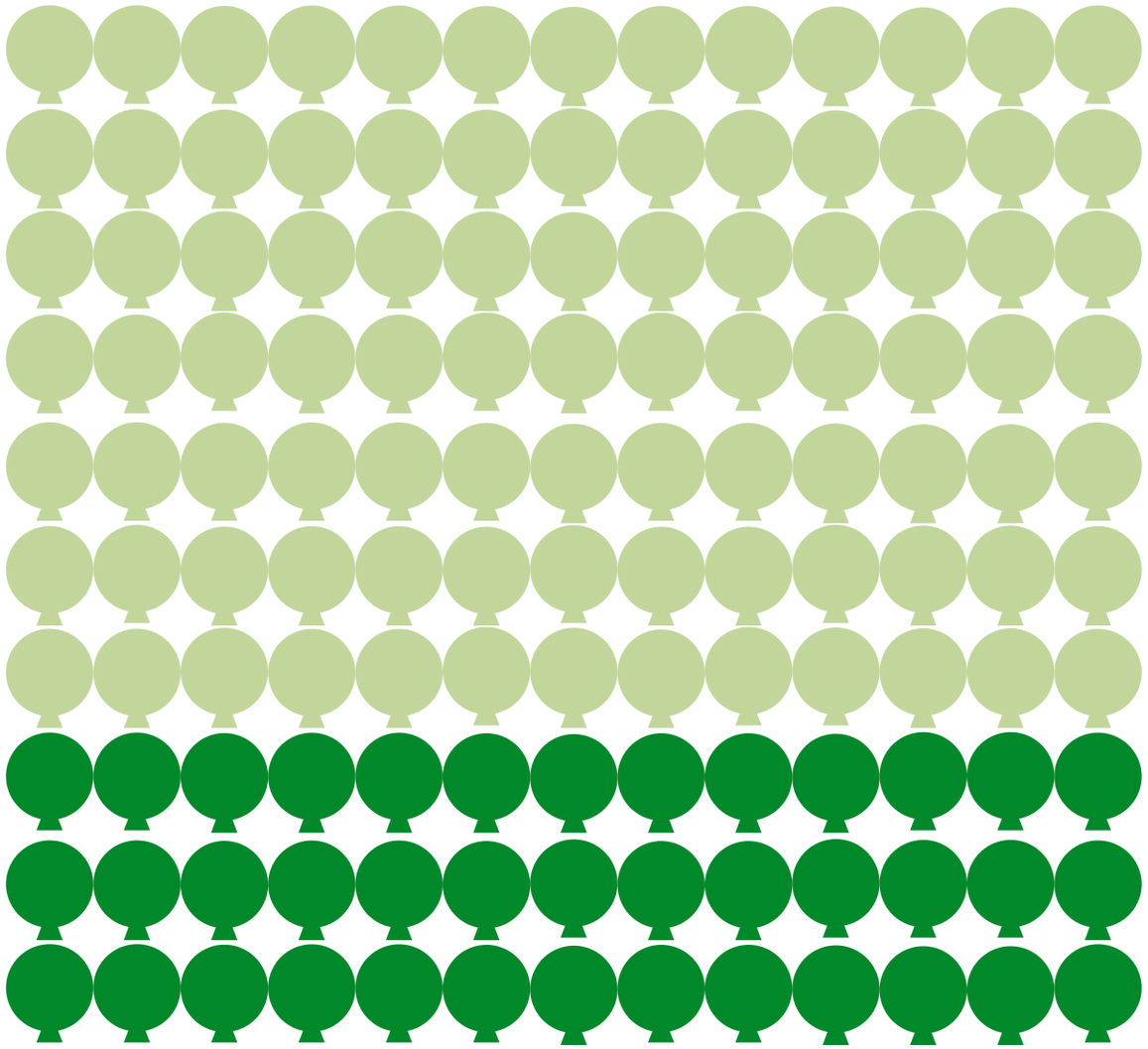


Plausible situation by end of 2020

Which option leads to the largest CO reduction?
And - also important - at which cost?

Independent fuel suppliers, already today:

- Deliver significant GHG-emissions in the transport sector
- By providing low-carbon intensive fuels through blending of sustainable biofuels
- That fit in today's infrastructure and vehicles (both light duty and heavy duty)
- And as a result are cost-efficient as compared to other alternatives that are entering the market
- Even more can be achieved

This message needs to be advocated at national and European government bodies

What is the European vision towards low carbon and transport?

Europe steers towards a low carbon, resource efficient economy in 2050

- Less dependent on non-European resources
- Transition in energy supply: from ***central*** -> ***de-central***,
- Focus on energy saving and higher energy efficiency,
- Transition to a full renewable electricity supply

In **transport sector** volumes of fuels are expected to decline due to:

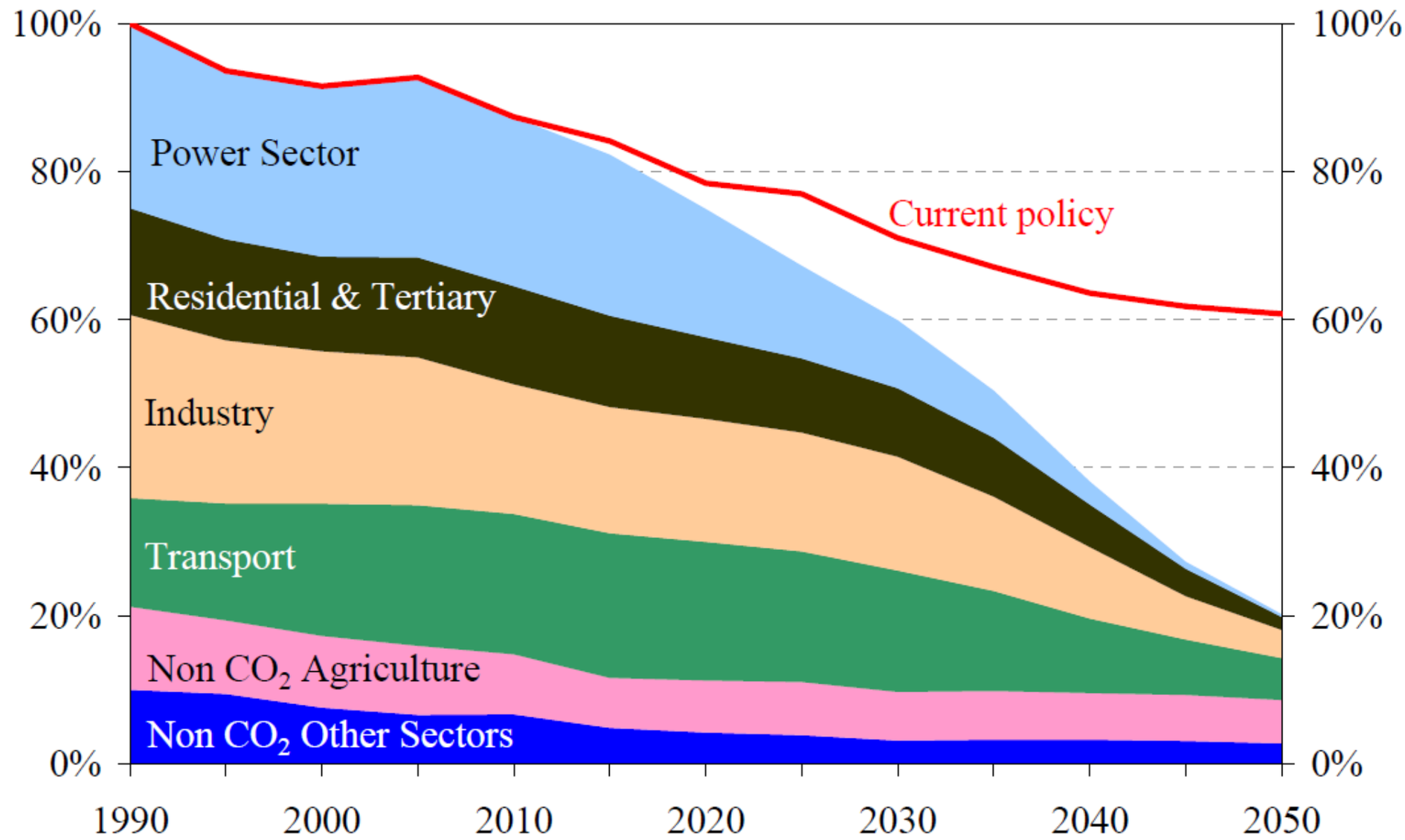
- Focus on efficiency
- Demographic changes (aging population)
- Socio/economic impacts:
  - ongoing urbanisation impacts transport modality
  - younger generations: connectability more important than automobility

In **heating market** energy demand is expected to decrease and shift to renewables:

- isolation of buildings
- passive-houses - zero energy buildings - energy generating buildings
- shift to biomass pellets, waste-heat based district heating

Europe steers towards a low carbon economy in 2050

Figure 1: EU GHG emissions towards an 80% domestic reduction (100% =1990)

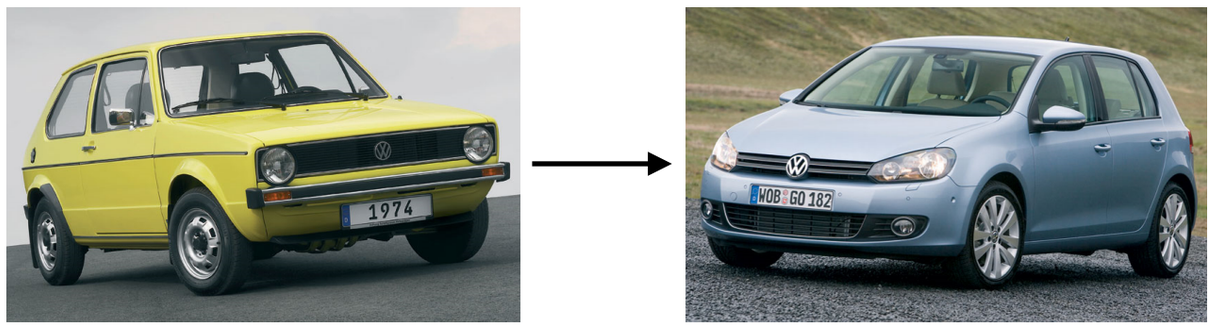


Source: EC, 2011 A roadmap for moving to a competitive low carbon economy in 2050

Europe steers towards a resource efficient economy in 2050

EC also targets increasing Resource Efficiency
via its “Roadmap to a Resource Efficient Europe”

- Improving resource efficiency
- Decoupling economic growth and resource utilization
- Increasing competition power
- Improving security of supply



1974-Golf I to 2010 Golf VI:

50% more km’s per unit of fuel

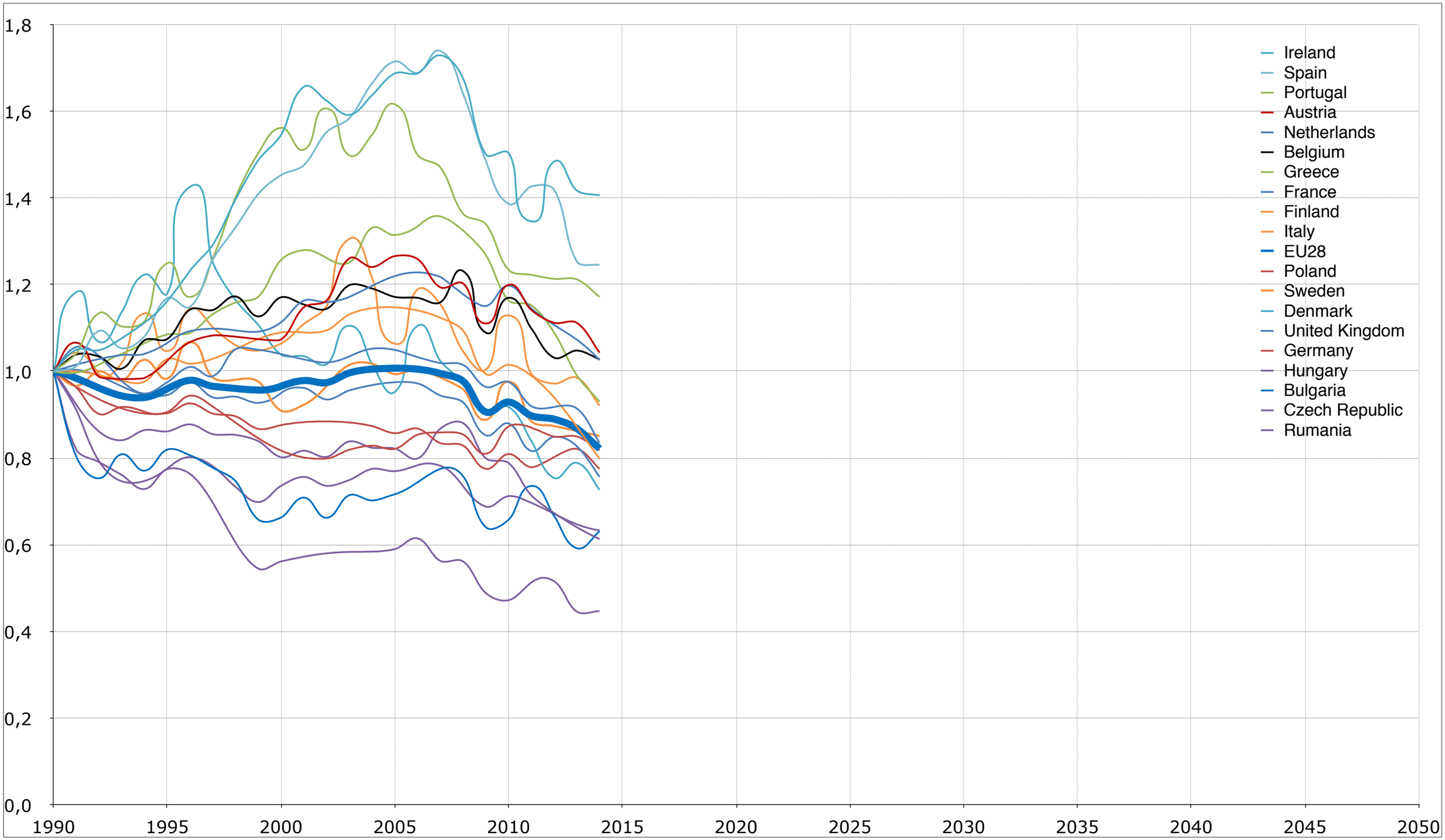
(even though Golf VI is 50% heavier)

iPad to iPad Mini:

same functionality, 50% less materials

2020 targets	2030 targets	2050 vision
20% share renewables in final energy use	27% share renewables in final energy use	
20% less GHG emissions (to 1990 levels)	40% less GHG emissions (to 1990 levels)	80-95 % less GHG emissions (to 1990 levels)
20% increased energy efficiency	27% increased energy efficiency	
10% share renewable energy in transport		

How have GHG emissions in EU Mss developed since 1990?



Based on: BP Statistical Review, 2014; websites EC, DE, DK, SE en UK

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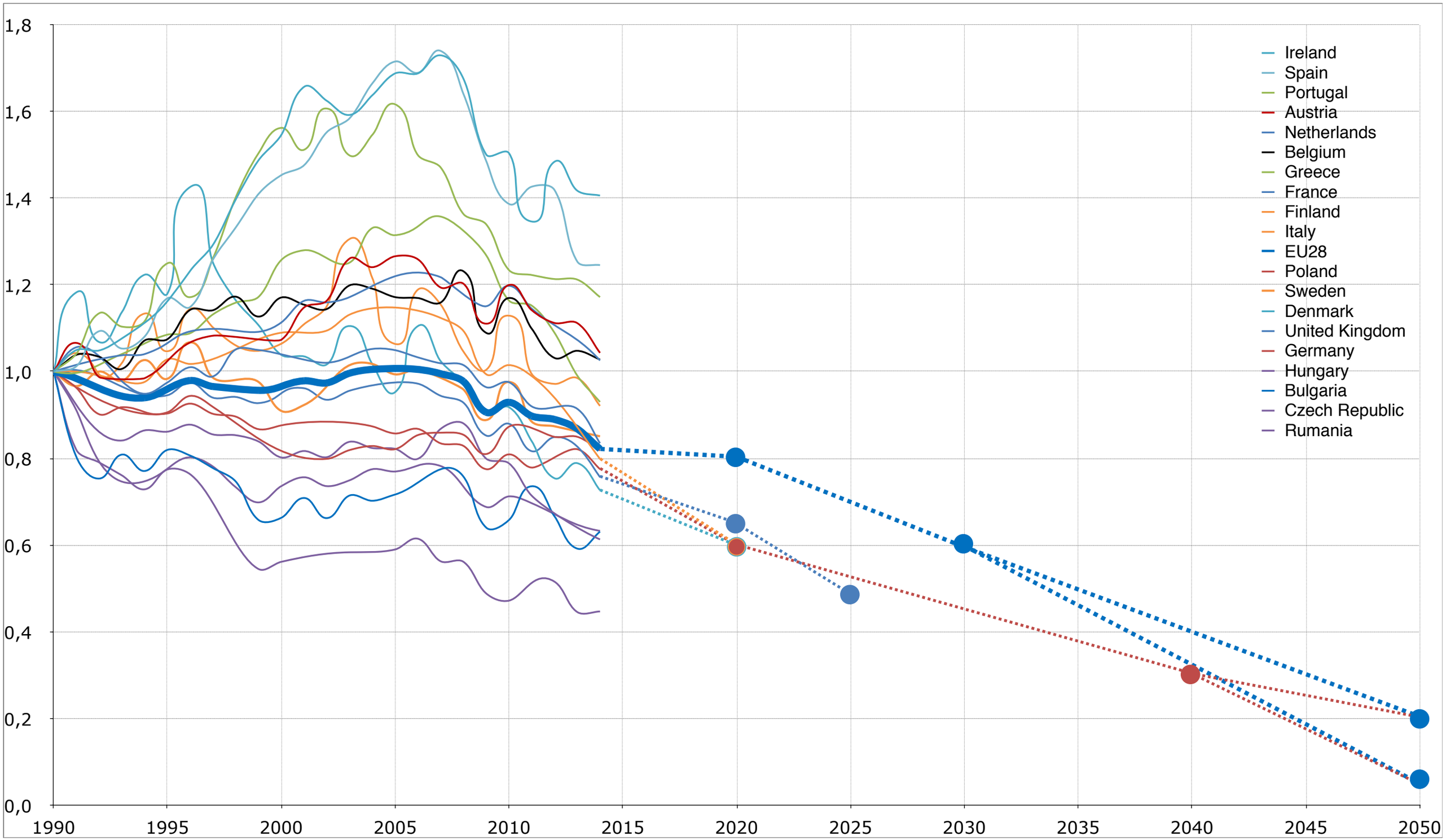

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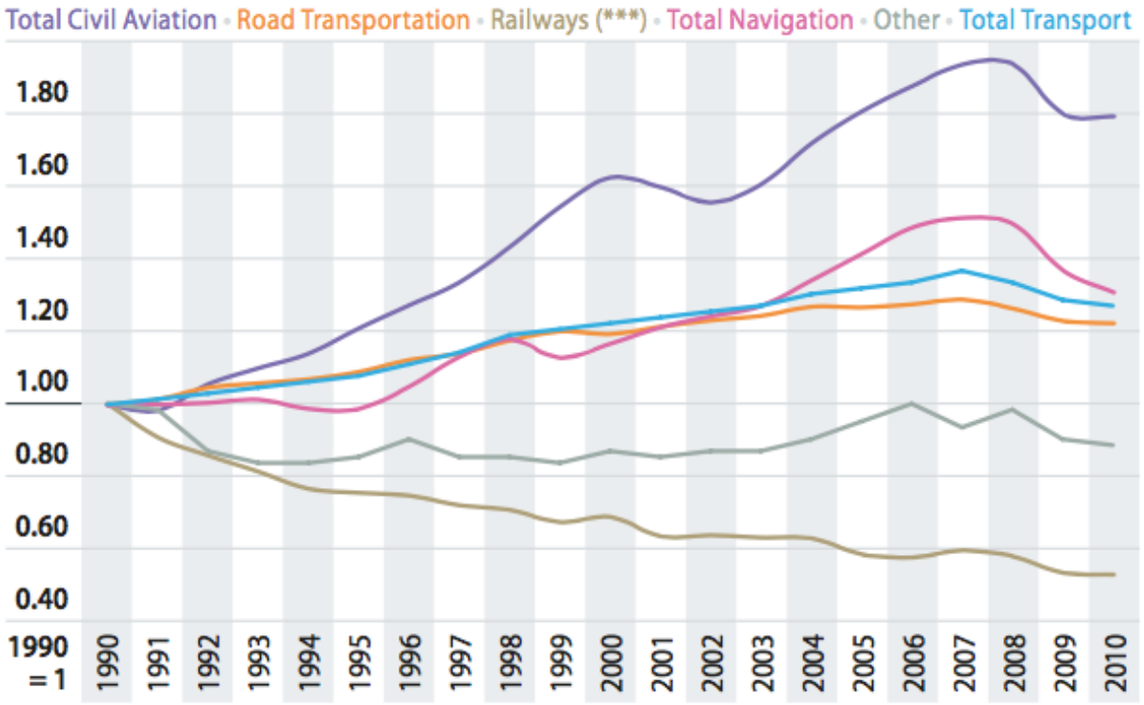
Which trends do we see in the EU transportsector?



Notes: (*) Excluding international bunkers (international traffic departing from the EU); (**) Including international bunkers but excluding LULUCF; (***) Excluding indirect emissions from electricity consumption; (****) Combustion emissions from all remaining transport activities including pipeline transportation, ground activities in airports and harbours, and off-road activities.

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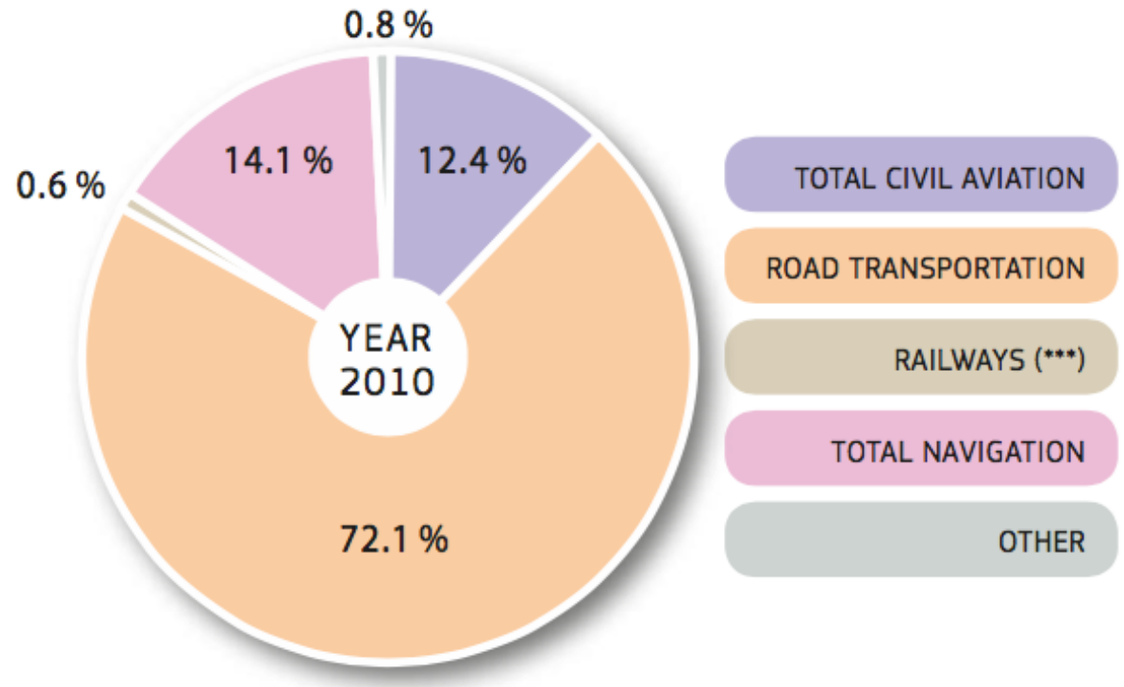
Source: European Environment Agency (EEA), August 2012



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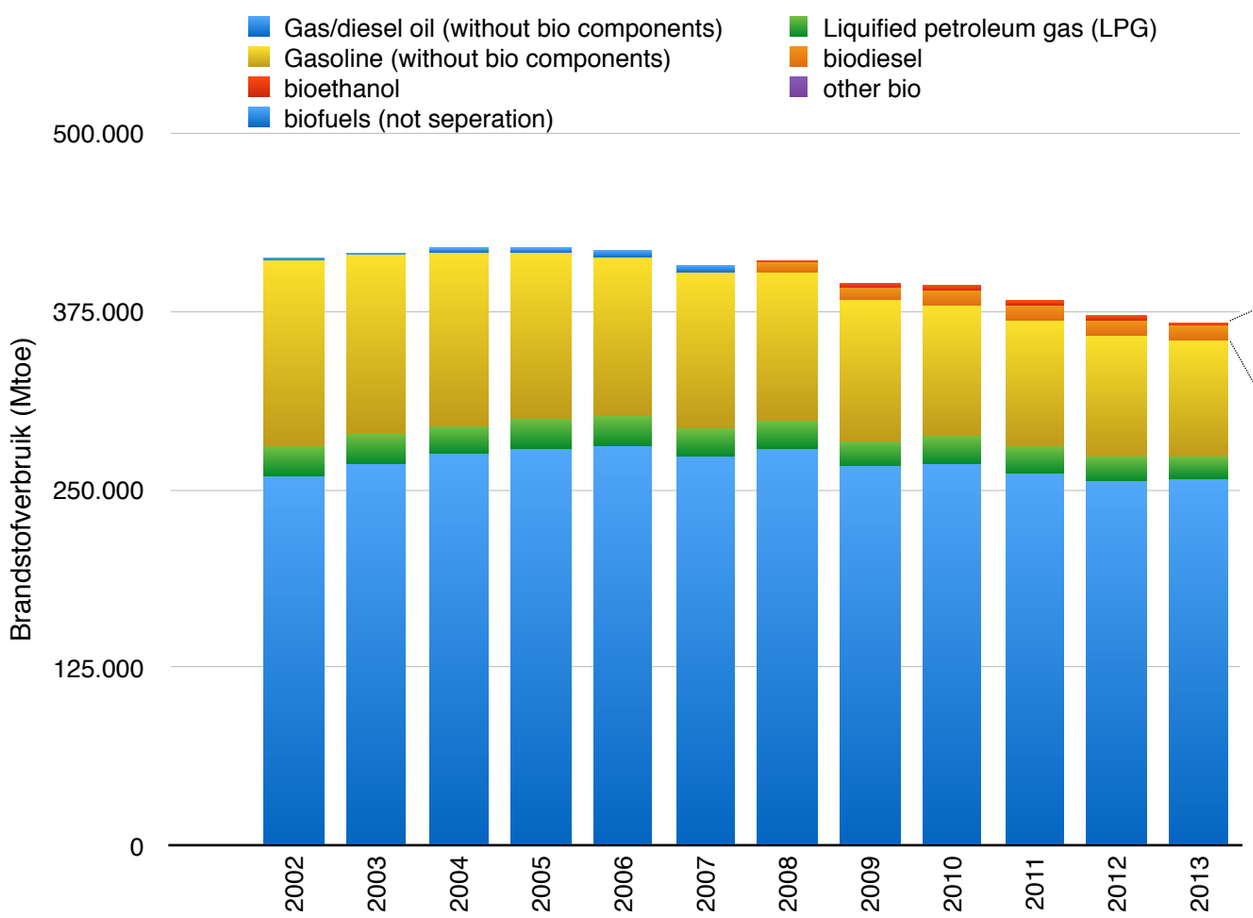
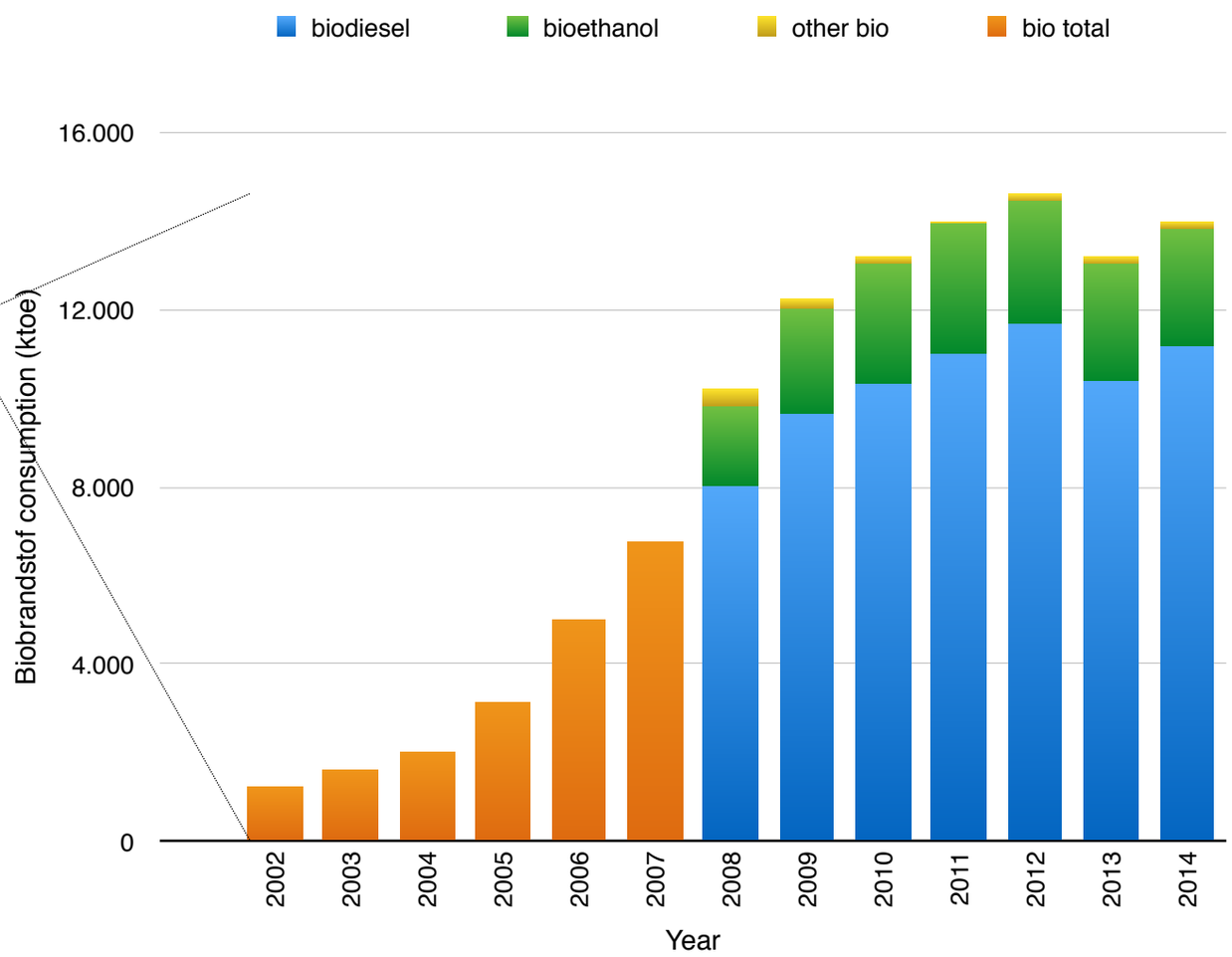
Source: European Environment Agency (EEA), August 2012

Source: EC - Transport in Figures, 2014

In EU road transport volumes are declining for already a decade

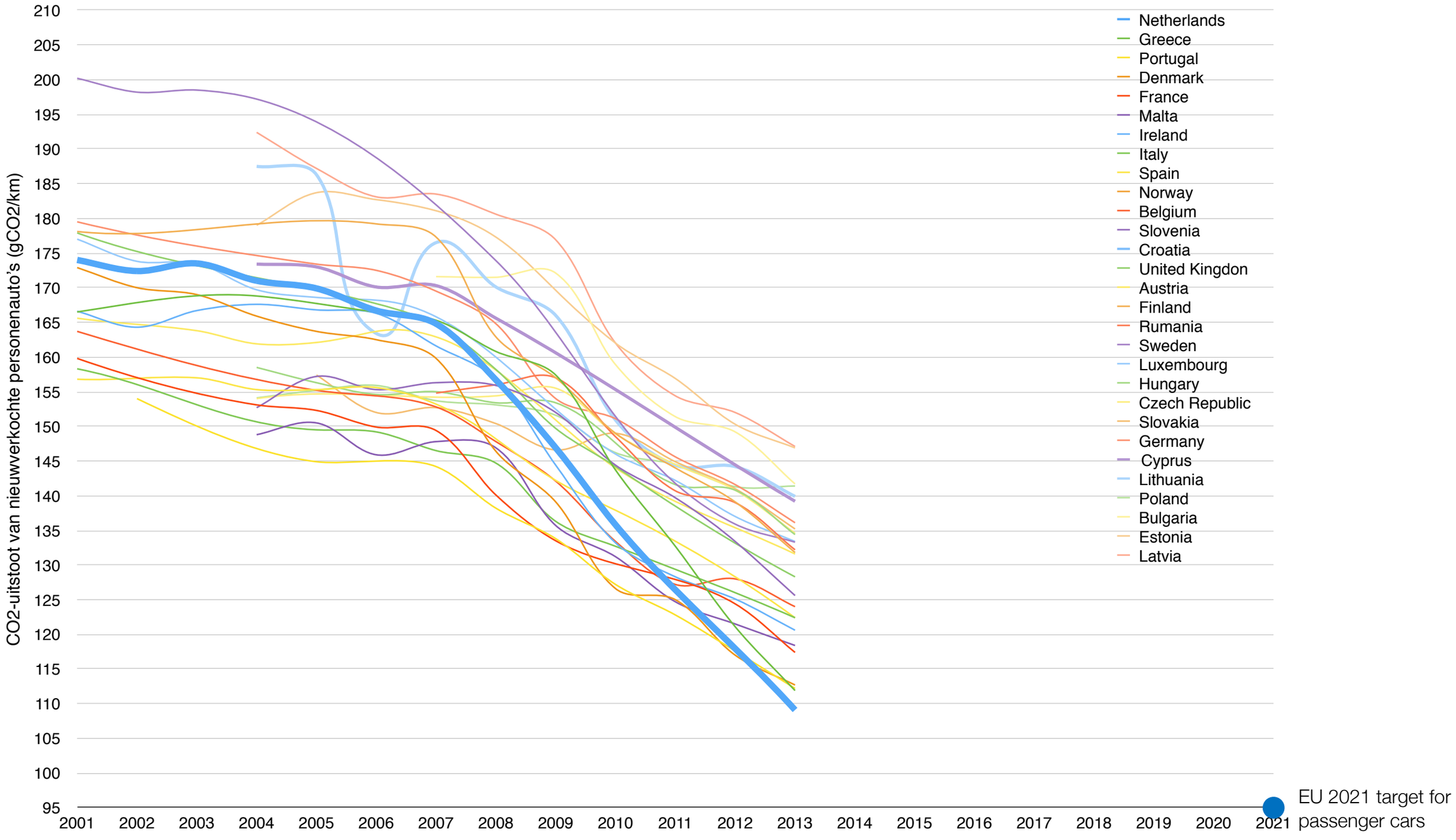


Source: BP - Statistical Review 2014; Eurostat, EurObserv'er



Source: BP and various reports EurObserv'er

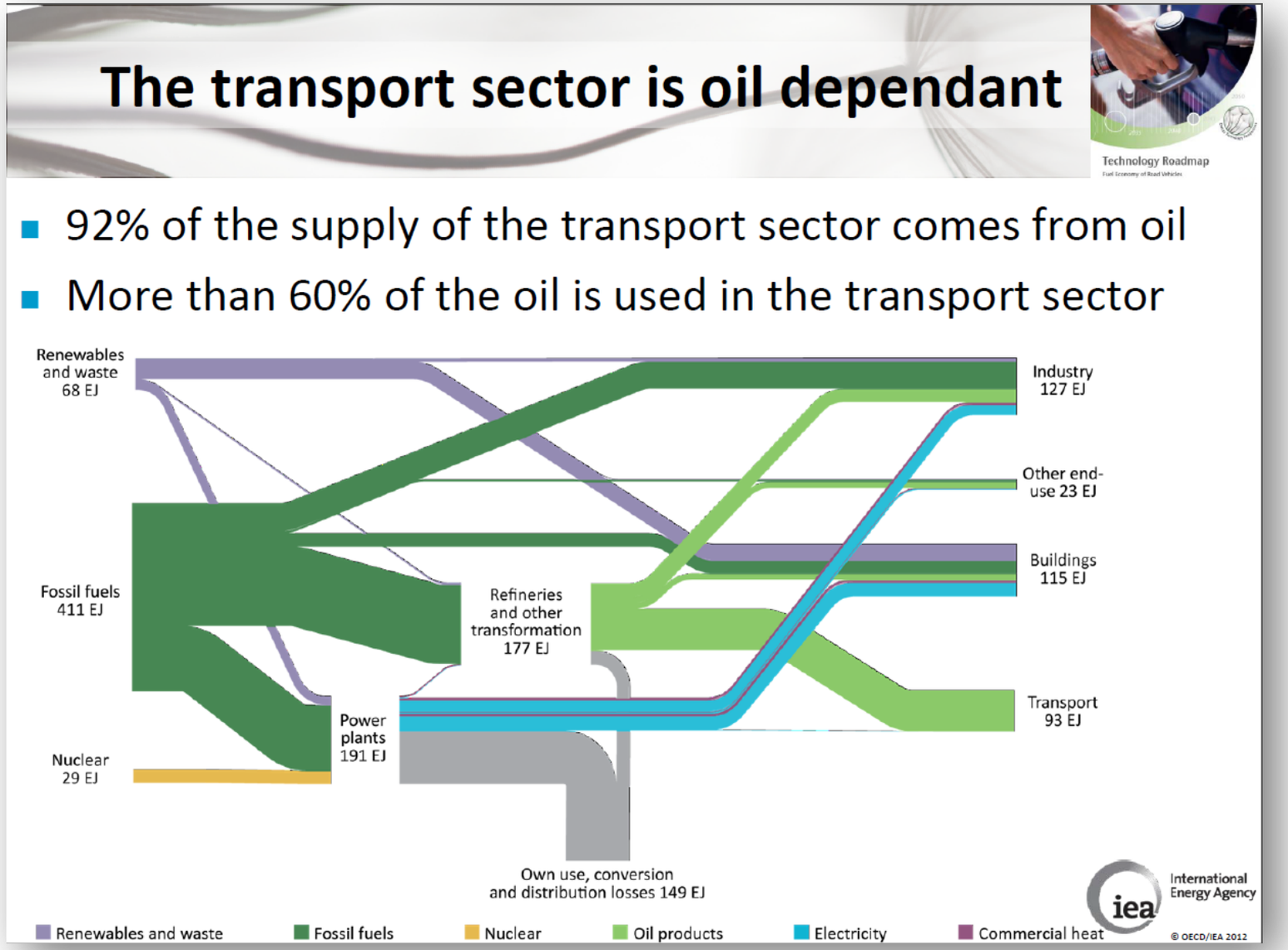
Vehicles are getting more and more efficient



Source: EEA, 2014

Europese Commission prepares for deployment of alternative fuels infrastructure

- To achieve GHG-emission reduction in transport sector it is needed to:
  - improve vehicle efficiency
  - lower carbon intensity of fuels
- The EC views the reduction of fossil oil dependency as most urgent
- By gradually shifting to alternatives more economic value can be generated within Europe: **Green Growth**.
  2014 oil import was valued at approx. 1 billion USD/day
- October 2014Directive 2014/94/EU adopted to support MSs in the deployment of infrastructure for alternative fuels that can replace oil.
- Fit within existing infrastructure:
  - Biofuels
  - LPG
- Need for new infrastructure and vehicles:
  - Electricity
  - Hydrogen
  - Natural gas based fuels: LNG, CNG



Biofuels are part of a wider “Low-Carbon Fuel” category

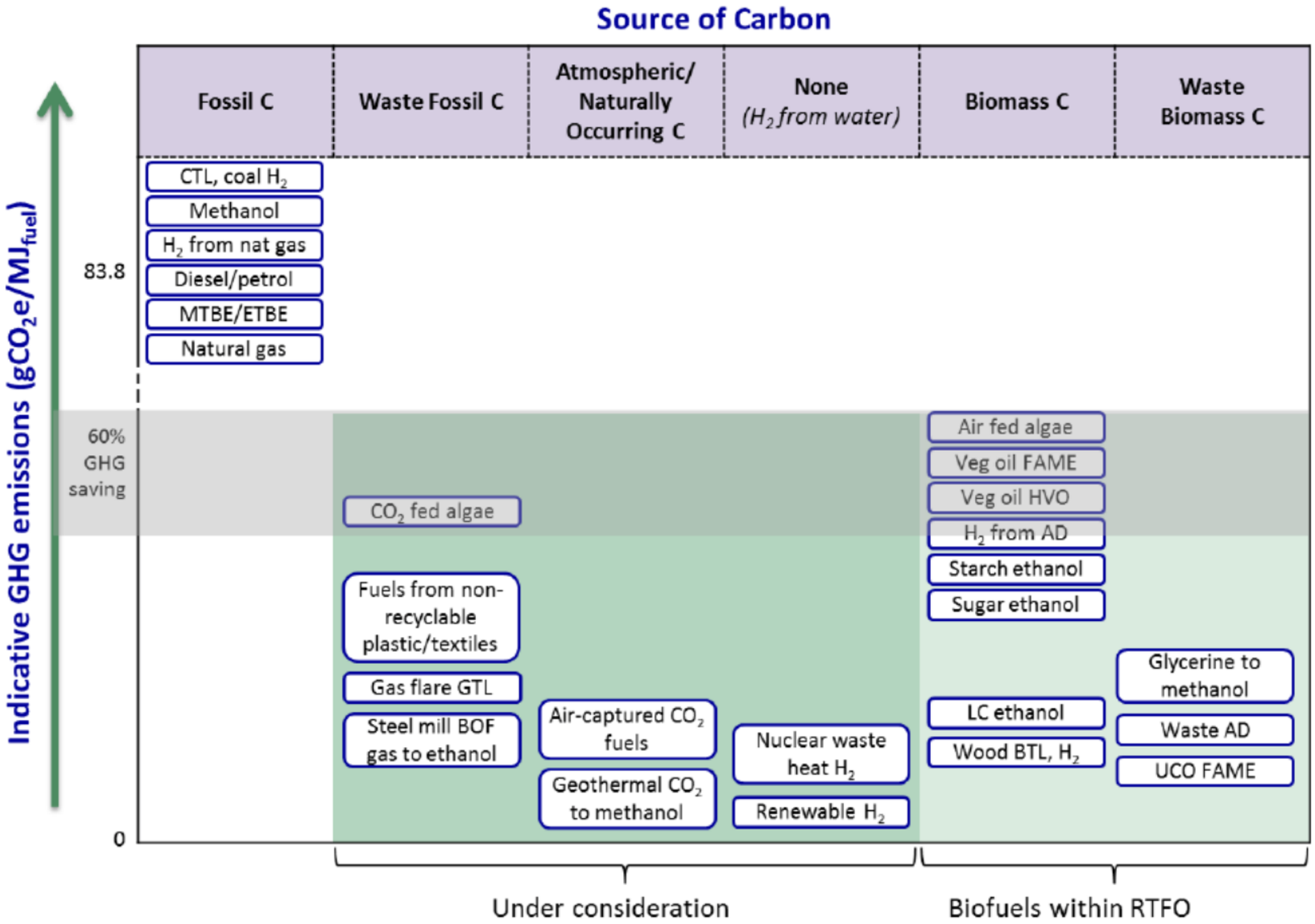


Figure 3: Fuels mapped based on carbon source and indicative GHG emissions.
Note the y-axis is <u>not</u> to scale, and this chart is not intended to present a ‘GHG ranking’ of the various fuels (the positioning is merely indicative)

Source: E4Tech, Ecofys, 2015

Low-Carbon fuels suit the independent fuel suppliers well:

- Offer smooth blending with mineral components
- Fit in current transport and distribution infrastructure
- Deliver high GHG-emissions in the transport sector
- Bring resource efficiency and security of supply
- Enable tailor made specialty products that can strengthen supplier-client ties
- Difficult to beat on cost-efficiency by other alternatives
- Require careful design of a Low-Carbon fuel strategy for strong business cases and new partnerships

CLIMATE

Scotland Is Going To Produce Biofuels From Whisky. Of Course.

BY **SAMANTHA PAGE** OCT 5, 2015 11:23AM

Dr Eve Bird works with bacteria in Celtic Renewables' lab, which has come up with a way to turn whisky waste to biofuel.

Source: website Think Progress, 2015

Colophon

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