Intelligent Energy Europe

“Eyes on the track, Mind on the horizon”

From inconvenient rapeseed to clean wood: A European road map for biofuels

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Main objectives

To develop an ambitious, yet realistic road map
for an effective deployment of biofuels
until 2030 in the EU27+

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Questions addressed in the road map

- A 10% target: how may we meet it?
- Would this answer to the drivers behind biofuels?
- 2nd generation biofuels: how to pave the way?
- Broader strategic issues

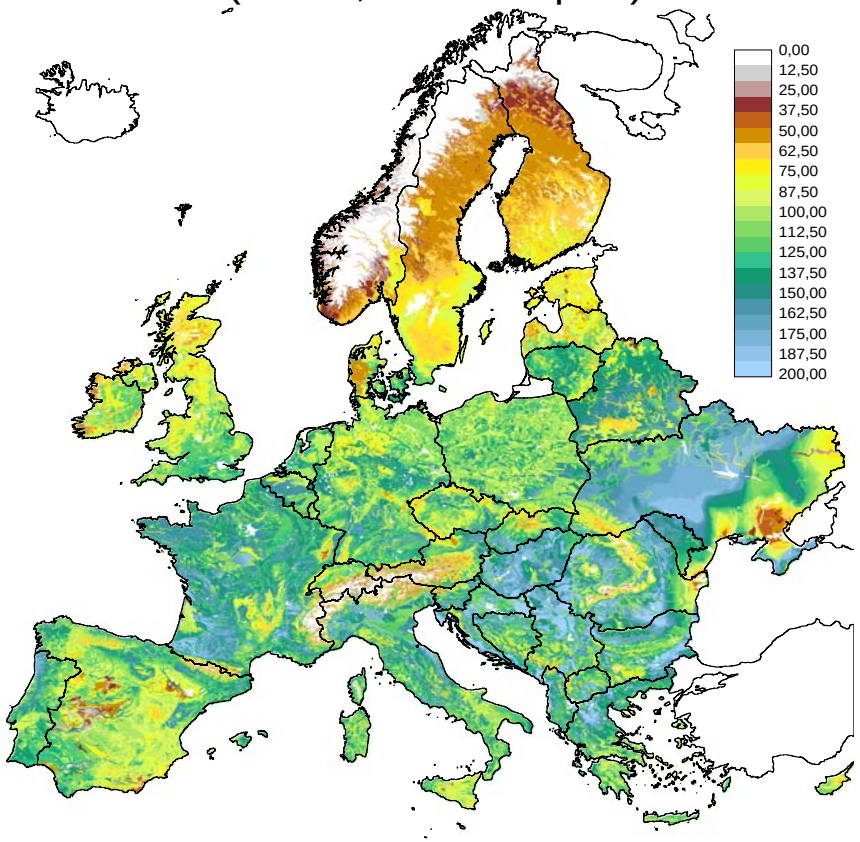
Meeting EU 2020 objective: 1st generation

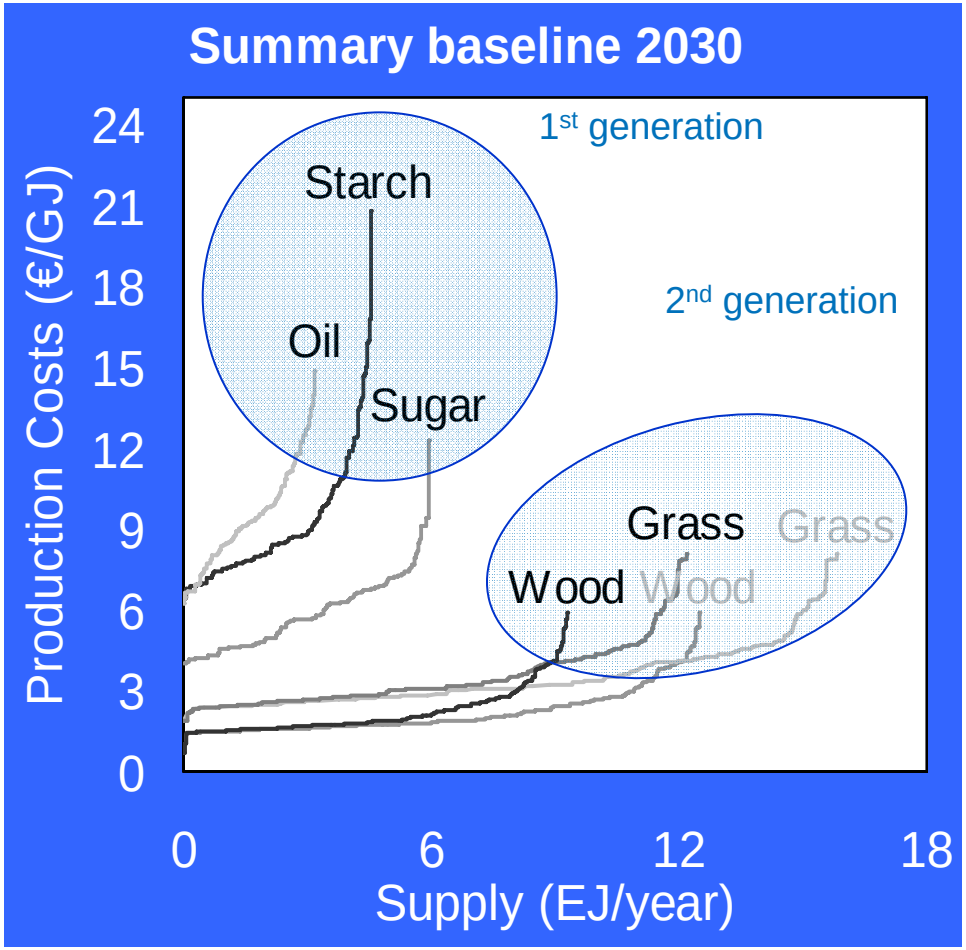
- Can be met by conventional biofuels
  - European production on agricultural lands
  - Highest potentials in new member states, Ukraine
  - No intrusion of e.g. Natura2000 areas
  - Limited import levels

- RES-E/H uses residues and forestry material
- Initial investment hurdle for 2nd generation

Feedstock assessment: significant potentials

(b) Attainable energy yields of 2nd generation lignocellulosic feedstocks (GJ/ha, biofuel equiv.)





1 EJ (ExaJoule) = 24 Mtoe

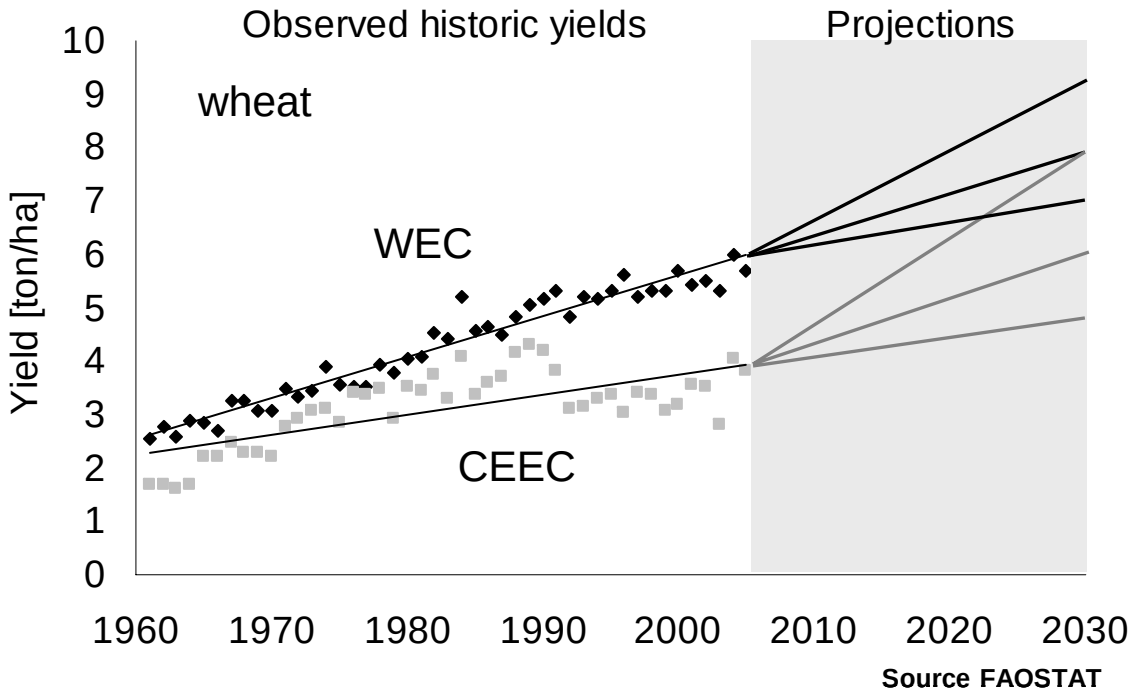
Critical issue: Yield projections

Observed yields

Extrapolation

Scenarios:

- Progress in (plant) science
- Farm size
- Agricultural management
- Access to CAP support



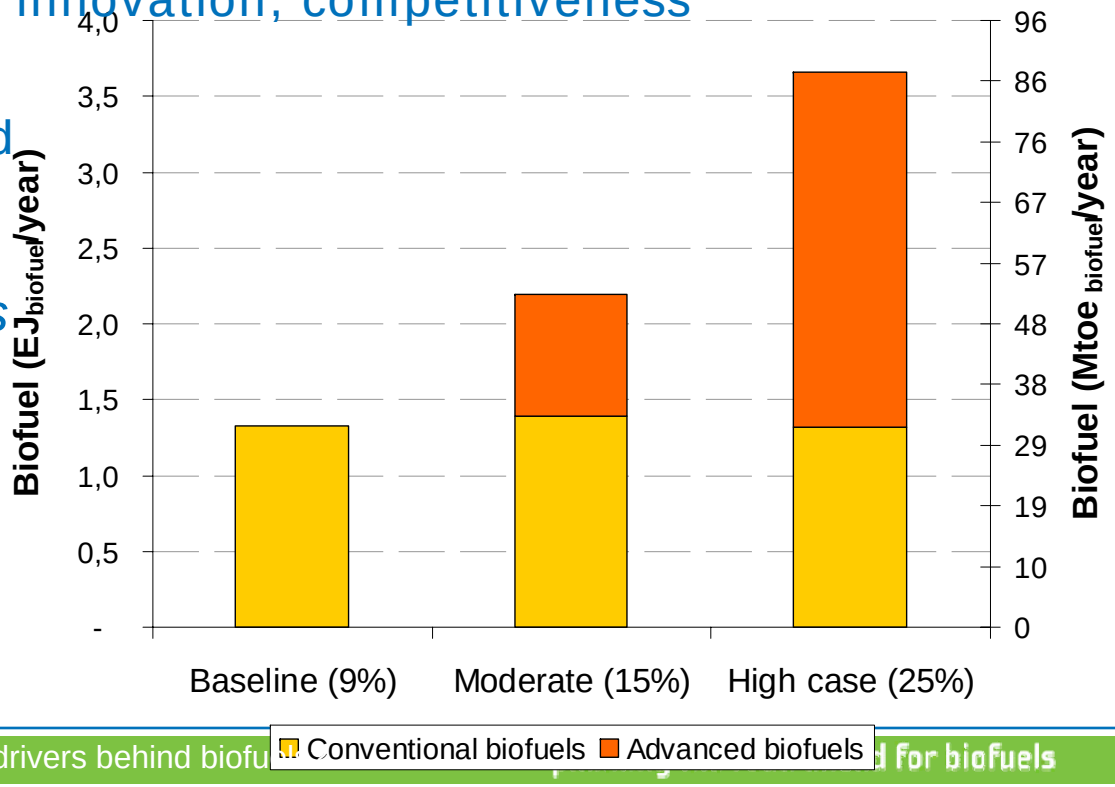
CEEC (Including Ukraine) is determining

Agri-economics poorly understood, modelled

However…

- Only moderate answer to the biofuels drivers
  - GHG savings 40-60%
  - Limited land efficiency
  - Moderate options for innovation, competitiveness
  - Supply to 10%,
    but not much beyond

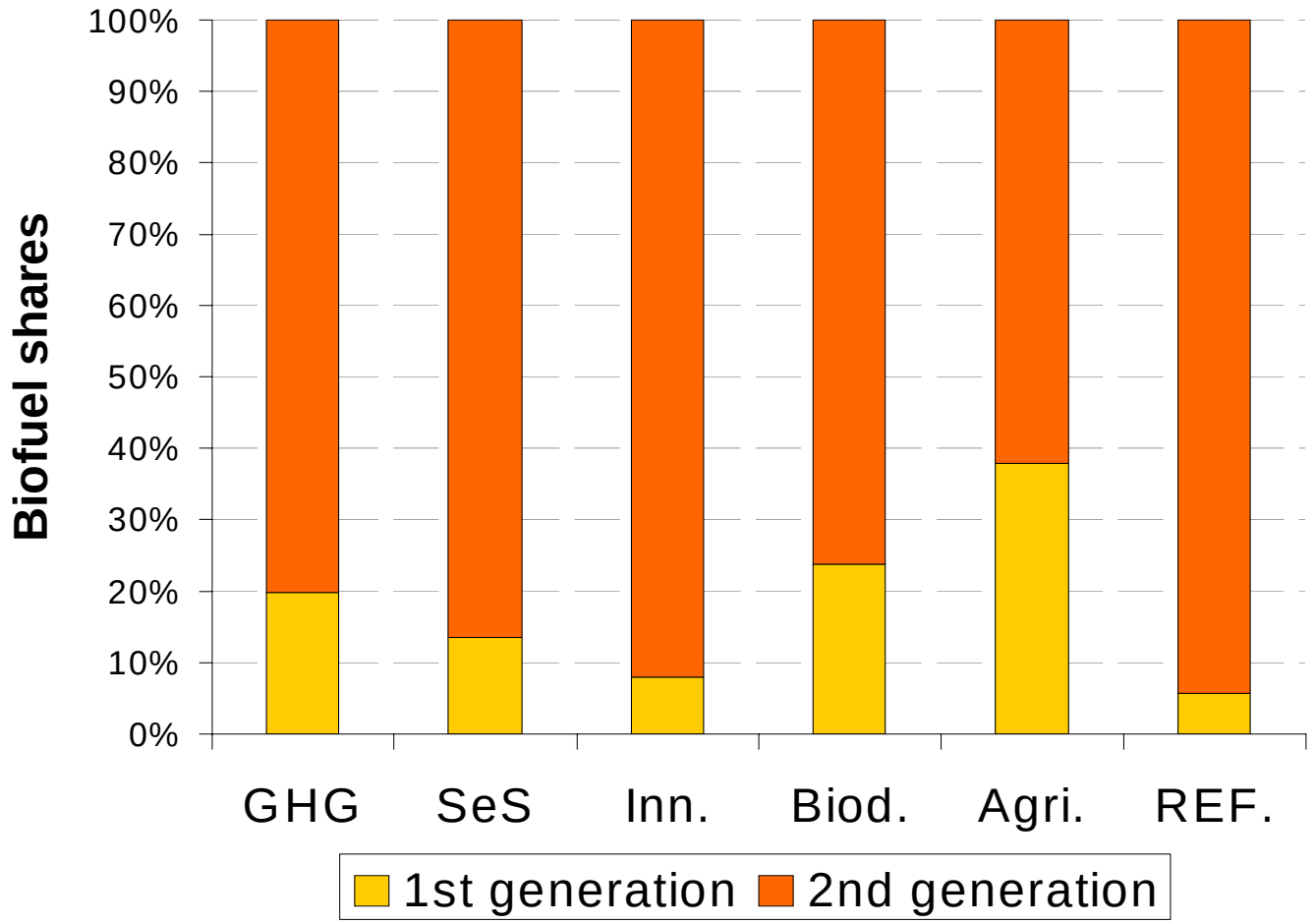
Second-generation biofuels score significantly better on all these criteria



...if we define driver-based policy packages...

	Policy making priority			Critical issue		Team
Policy measures:	GHG	SES	Innovation	Biodiversity	Agriculture	'REFUEL'
Biofuels target pathway	Moderate	High	High	Moderate	High	High
Ambition levels RES	High	Moderate	Low	Moderate	Low	High
Imports	Yes	No	No	Limited	No	Yes
CO_2 pricing	Yes	No	Yes	Yes	No	Yes
Energy crop premium	No	Yes	No	No	Yes	No
Investment subsidies	No	Yes	Yes	No	No	Yes
Specific targets 2nd gen.	No	No	Yes	Yes	No	No

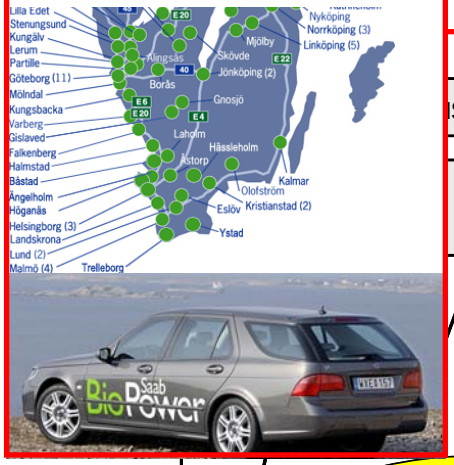
… 2nd generation becomes essential



Policies: paving the way for 2nd generation?

Good prospects for conventional crops
-> low interest in new ligno crops

Focus on low blends
High blends important



Transport, logistics: increasing trade flows

Oil companies, car manufacturers: optimise distribution and motoring to new (blend) fuels)

~~stry: new supply chains~~

Agri/Forestry: increase residues availability

Ligno crops (wood, grass)

Ligno residues

Food crops (wheat, rape seed)

1st generation conservation interests grow stronger

Second generation biofuels
(FT-diesel, ethanol, Di

High cost redu
potential

"...crime against humanity"

First generation biofuels (biodiesel, ethar

Limited cost reduction and learning pote

Diesel substitutes: No synergy
Completely different technologies

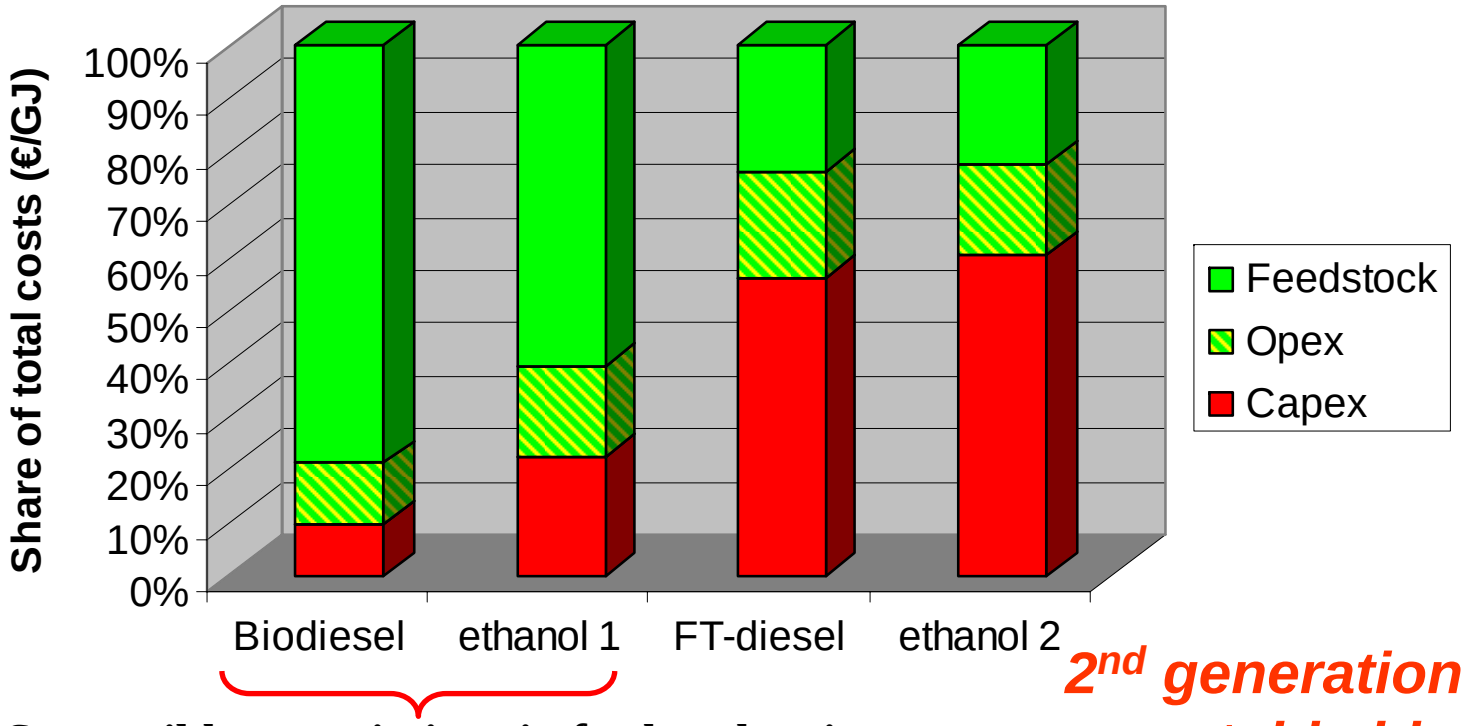
Biofuel antithesis establishment

2005 2010 2015 2020 2025 2030 [t]

Cost structures → Investment risks

"Always on": more susceptible to volatilities in biofuels prices

less in feedstock prices



Susceptible to variations in feedstock prices

Flexible in temporary reductions of production

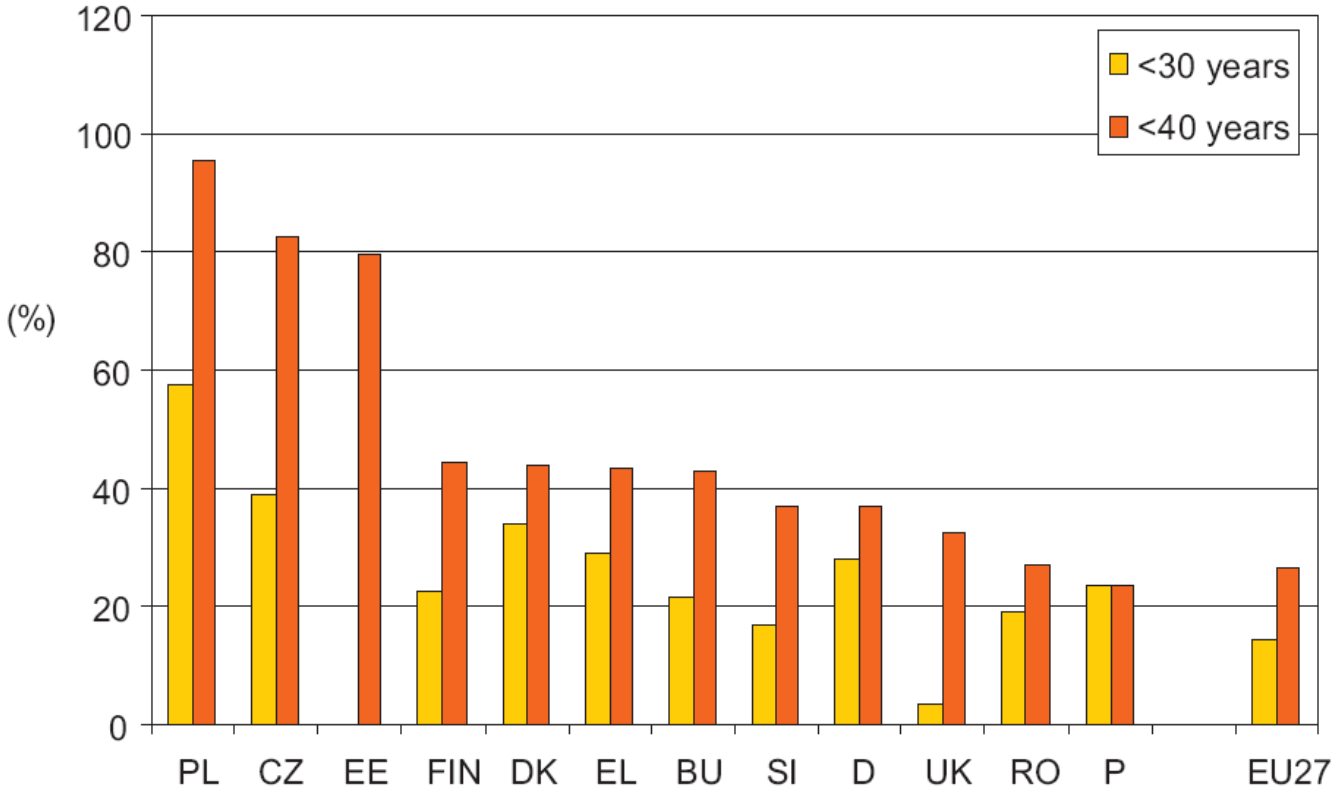
2nd generation requires a more stable biofuels market

How to pave the way or 2nd generation?

- ‘Double-counting’ (in quota) will have limited effect
  - Quota: price-inelastic demand
  - 2nd gen. competitiveness dependent 1st gen. & oil price
  - Creates advantage, but also market uncertainty
- 2nd generation costs: Investments are key factor
  - Investment support
  - Biofuel price stabilisation, e.g. minimum price guarantee
  - Policy stability
- Additional: lignocellulosic supply chains
- Search for stepping stones

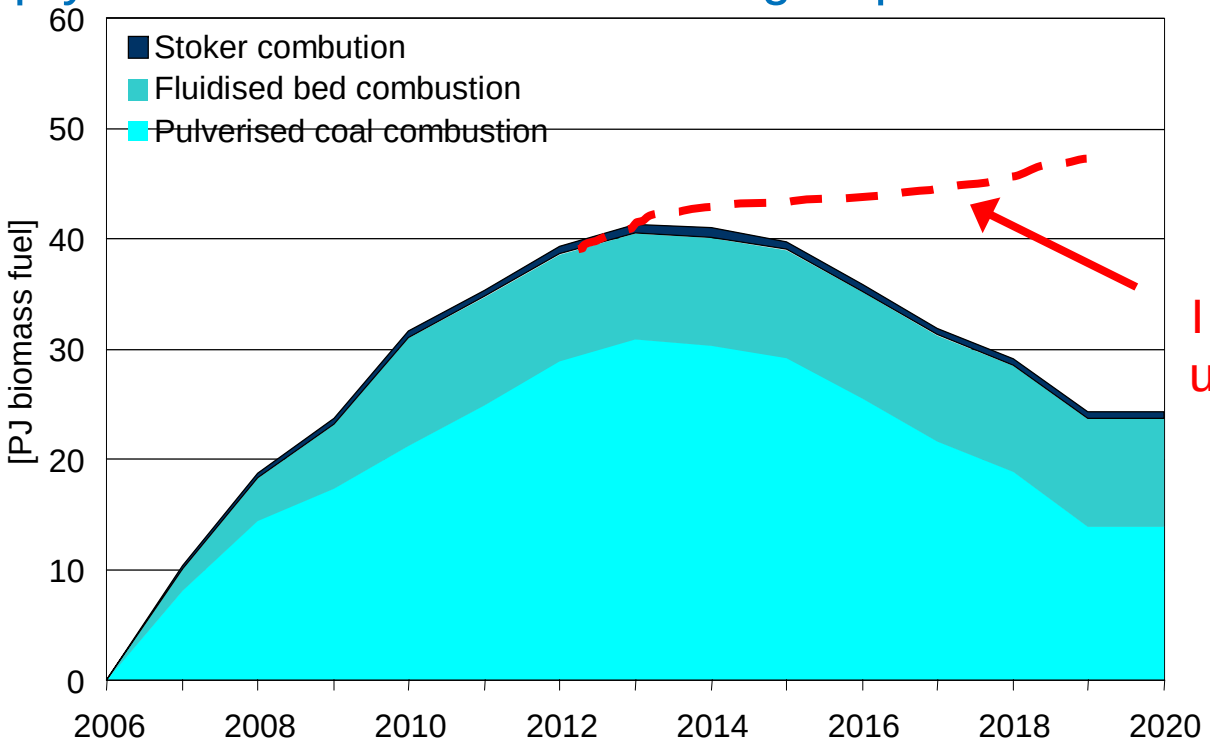
Stepping stones example: co-firing

In several MS the scale of lignocellulose supply for co-firing is significant compared to biomass for transport demand



Current co-firing opens up future supply

2nd gen biofuel production can exploit the established supply infrastructure as co-firing is phased out



Increasing biomass use for transport?

Dynamic modelling for the case of Poland

Conclusions

- ‘Plenty of space for biofuels’
  - But it will need to be mobilised
- 2nd generation crucial to make the difference
  - For all drivers except agricultural support
- Specific measures needed for their development
  - Current policies limited incentive
  - Focus on investment risks
  - Precursor role of 1st generation overrated
  - Other stepping stones conceivable
- Agricultural development essential

Thank you!

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