
The role of Biomass in the global energy mix: some considerations

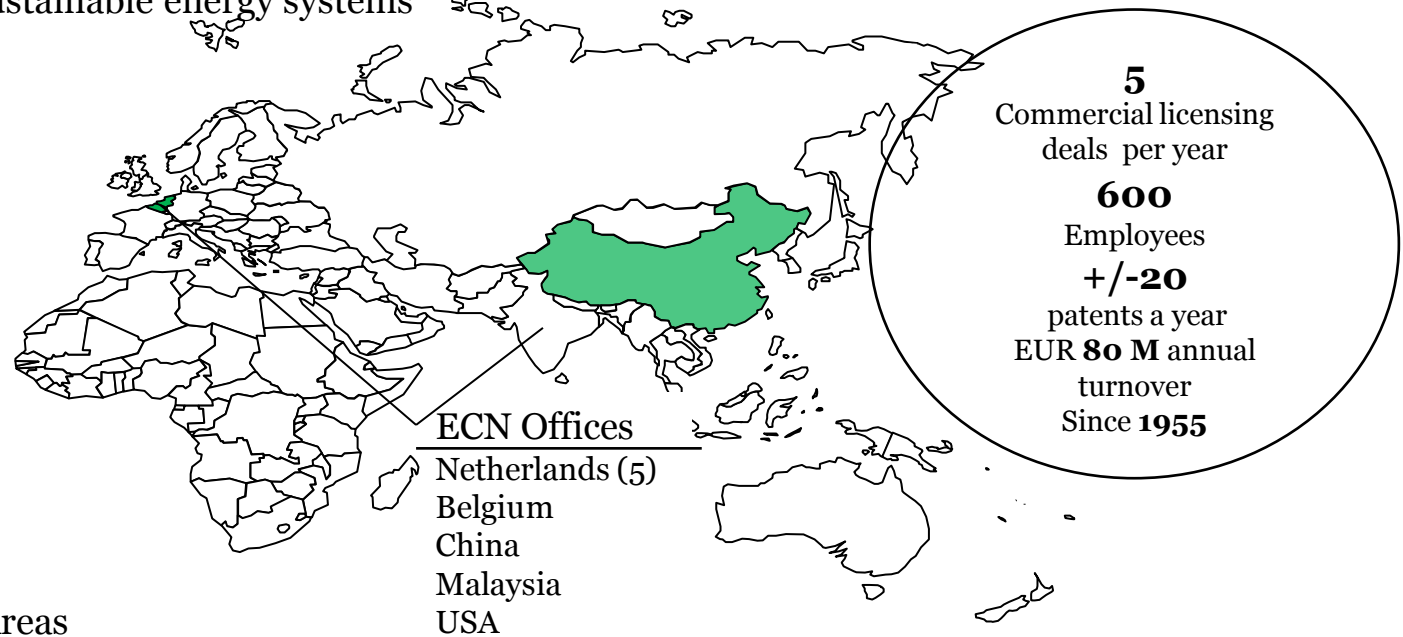
introduction

2016
Tokyo, May 18th

ECN at a glance

Mission

To develop knowledge and technologies that enable a transition to more sustainable energy systems



ECN Focus Areas



• Solar energy



• Biomass



• Policy studies



• Energy efficiency



• Wind energy



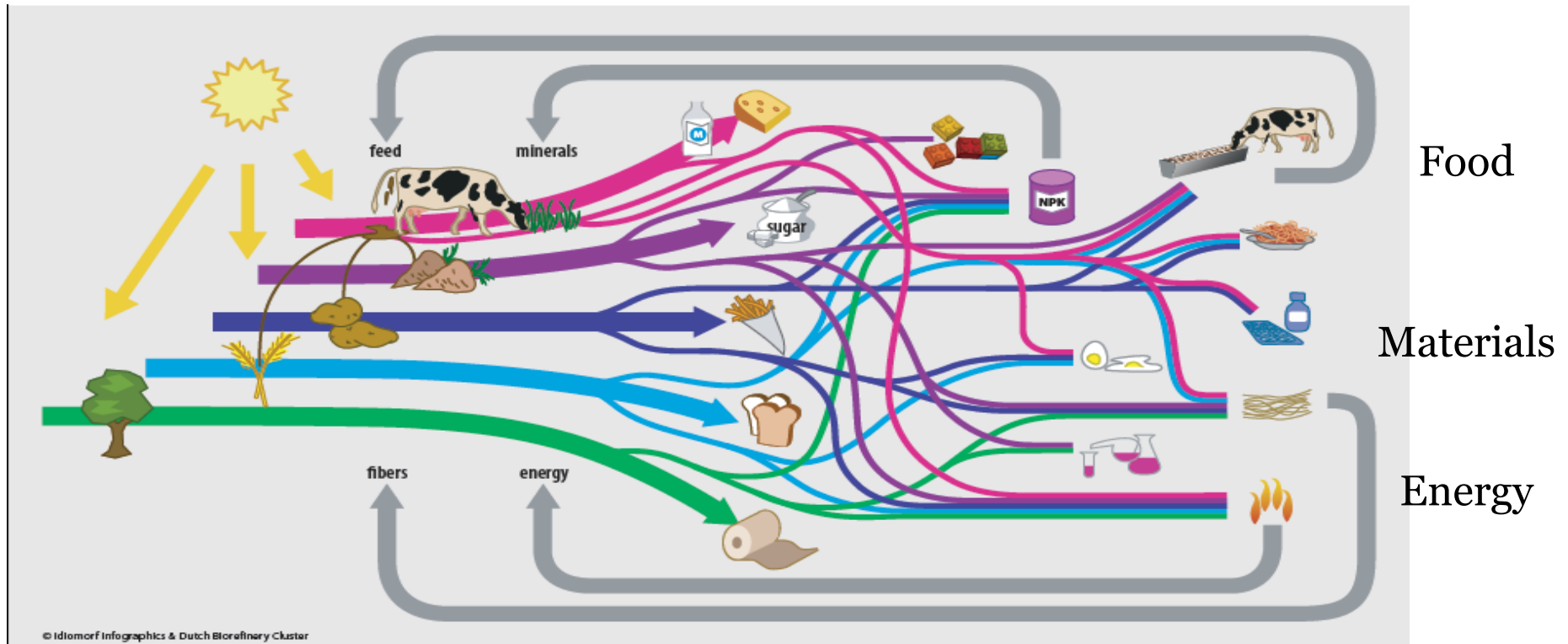
• Environment & energy engineering

In power markets ECN works with leading utilities, suppliers and heavy industrials

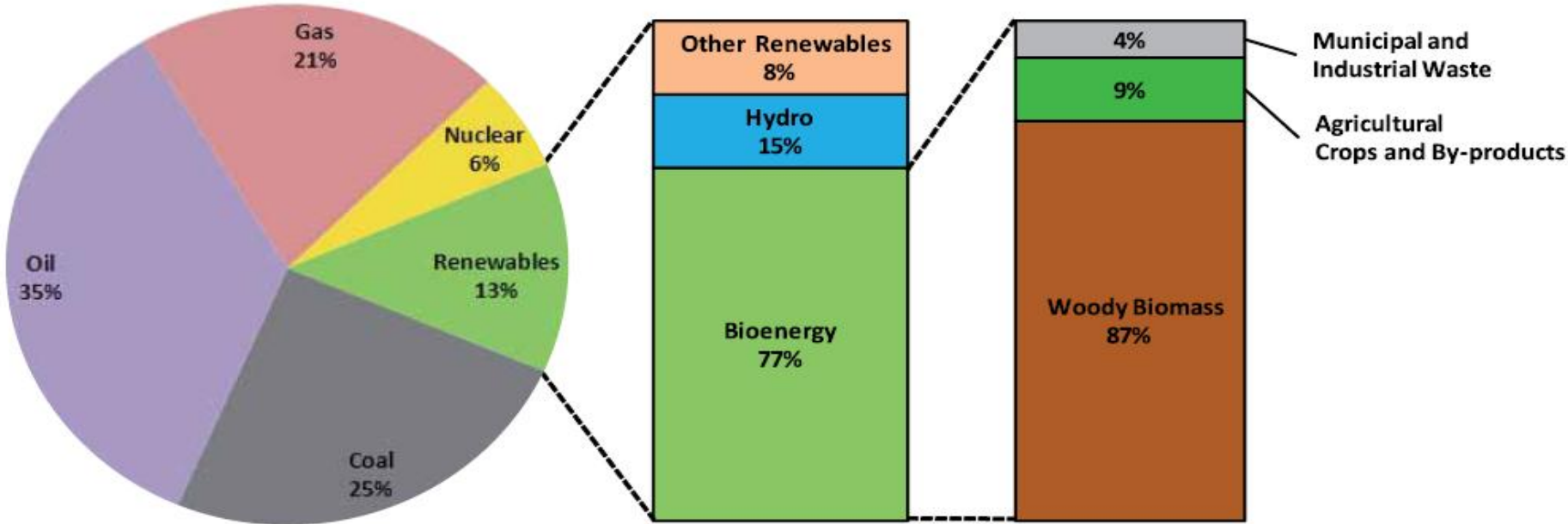
Selection of ECN clients and partners in multiple energy & industry sectors



Biomass and bioenergy are everywhere..



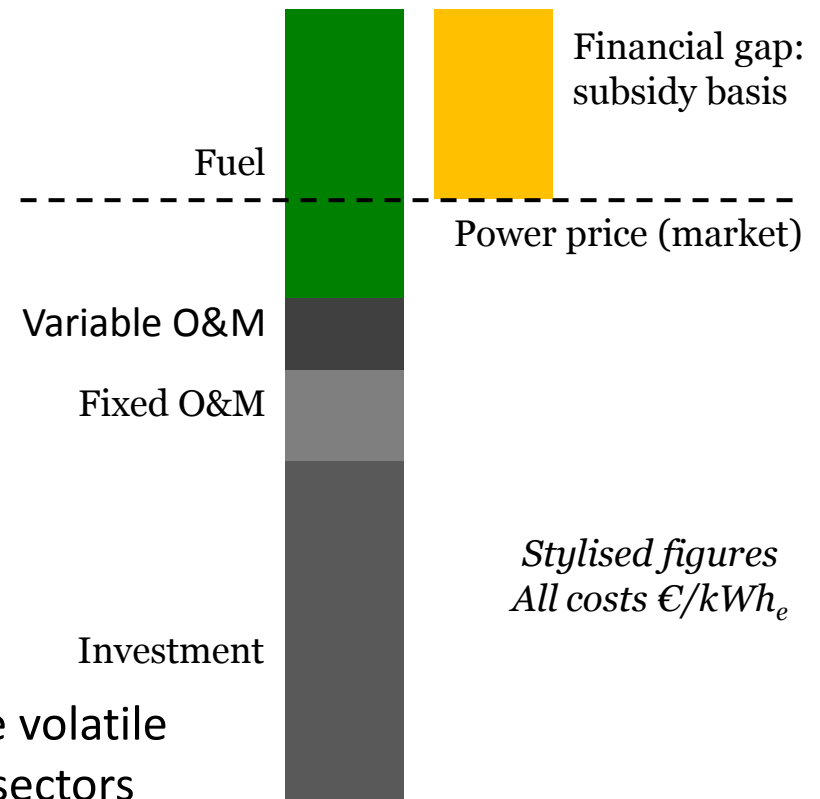
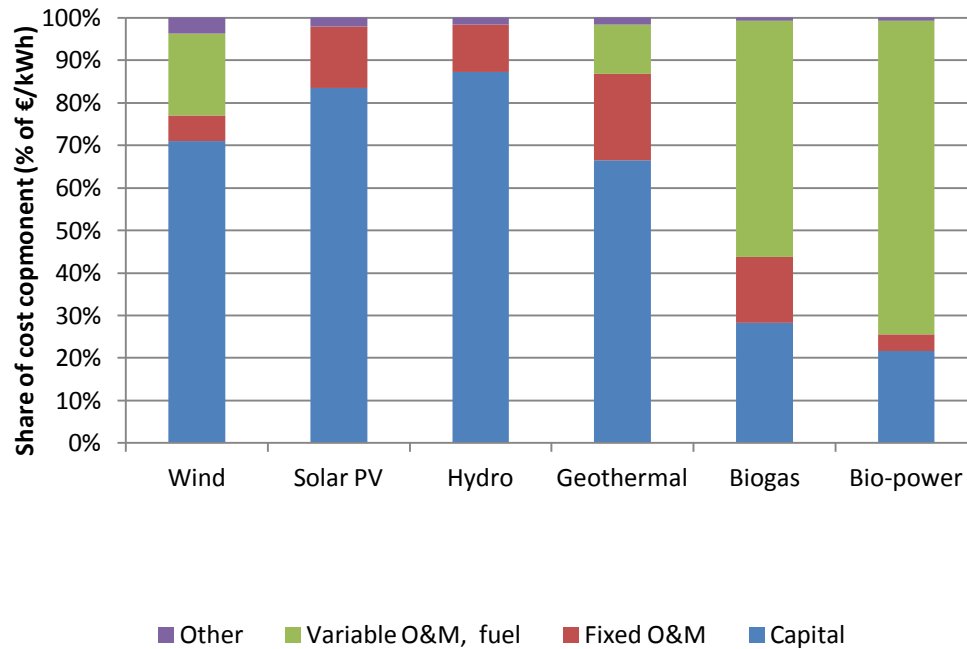
Current role of biomass in the global energy mix



But current usage concerns mostly traditional biomass

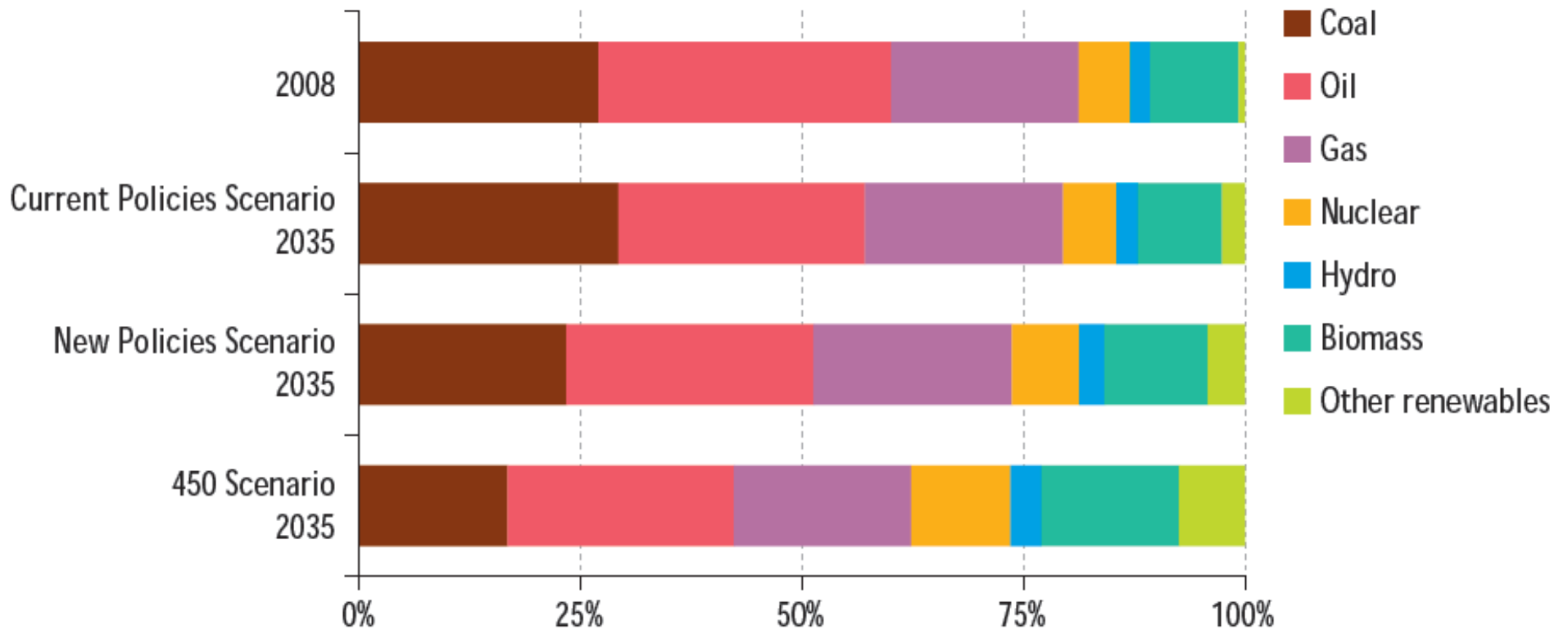


Biobased peculiarities : Fuel costs

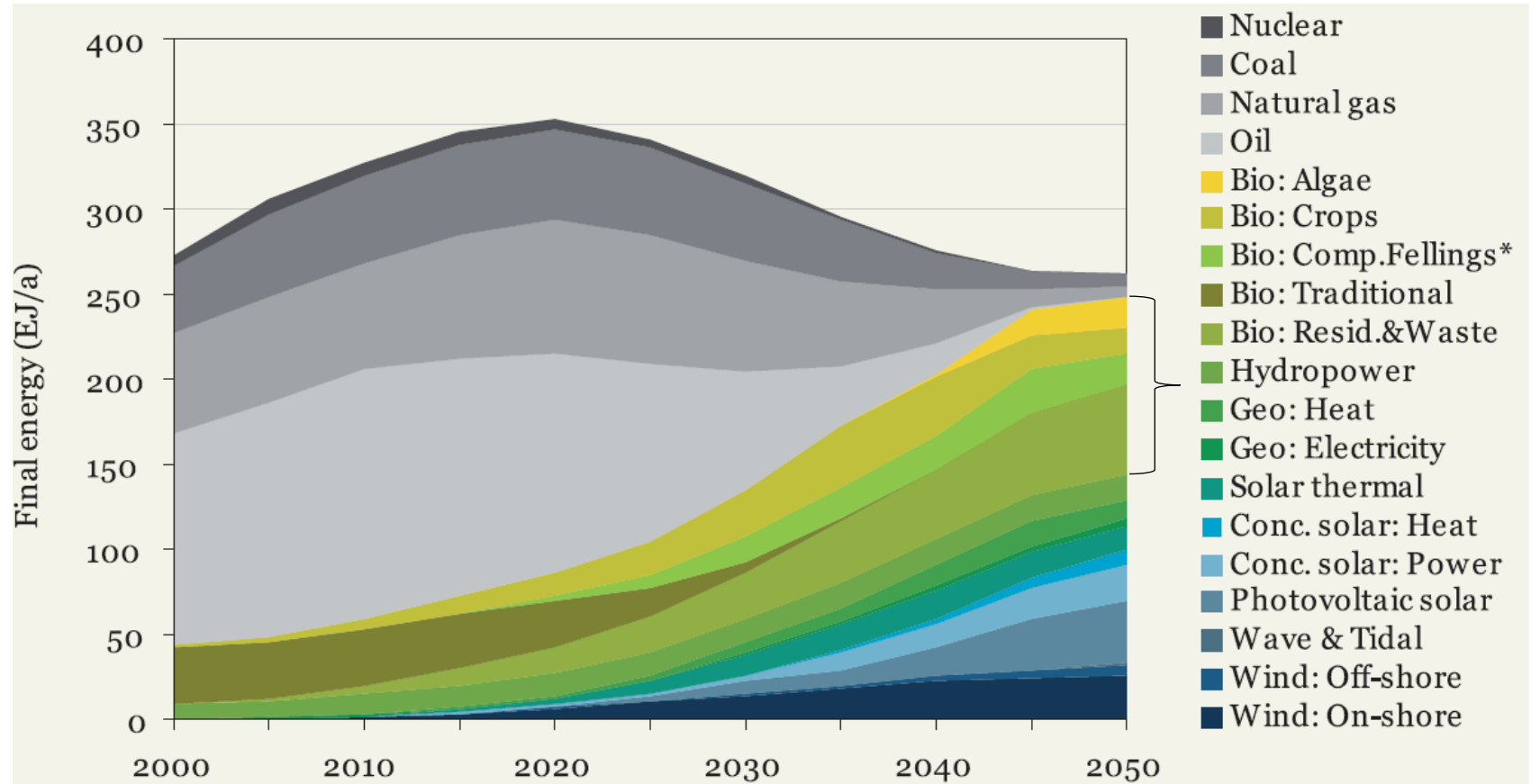


biobased options have fuel costs and prices can be volatile
 Structural changes, links with other demand sectors
 Short-term demand-supply dynamics
 Particularly hard for feed-in support systems

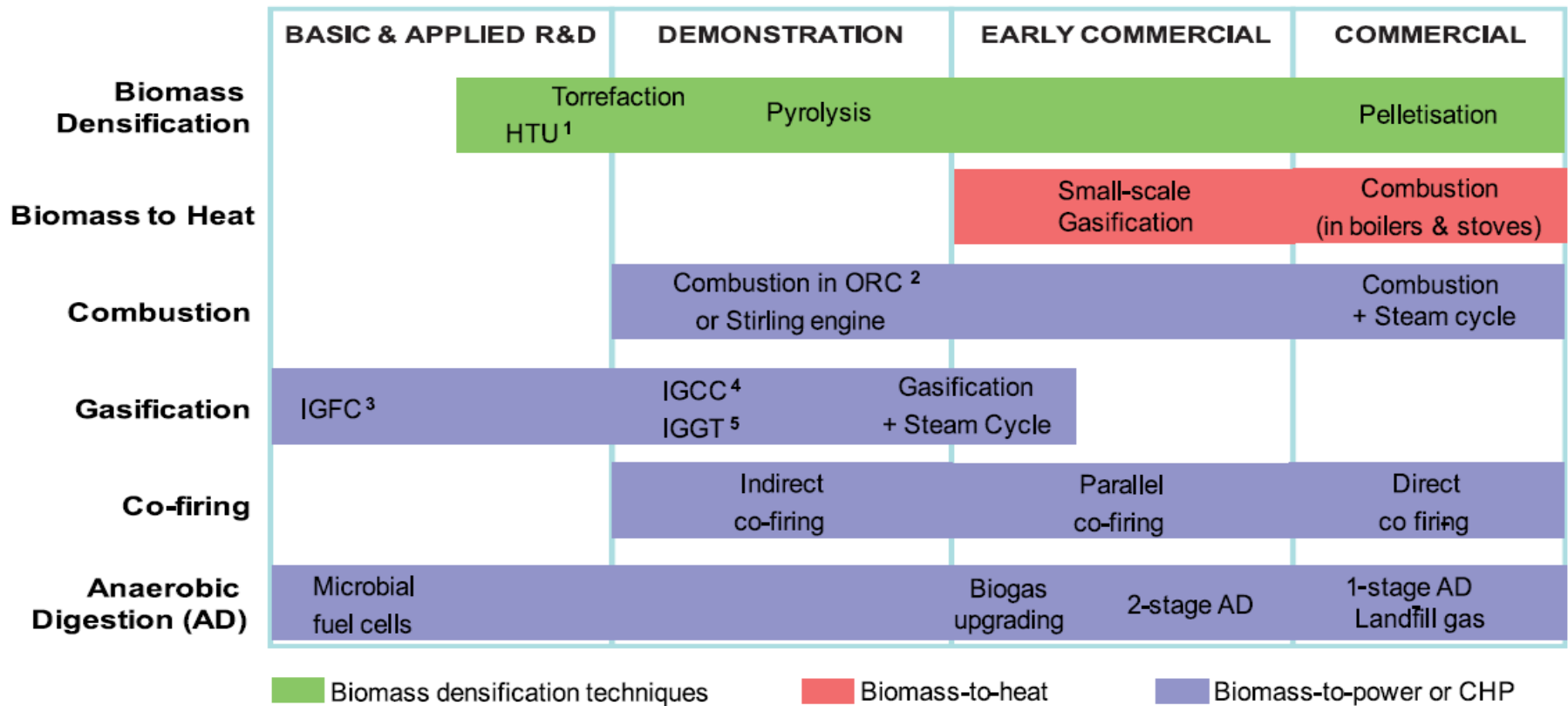
IEA WEO (2010): Bioenergy major RES



WWF/Ecofys (2010): Ditto



Wide variety of technologies...



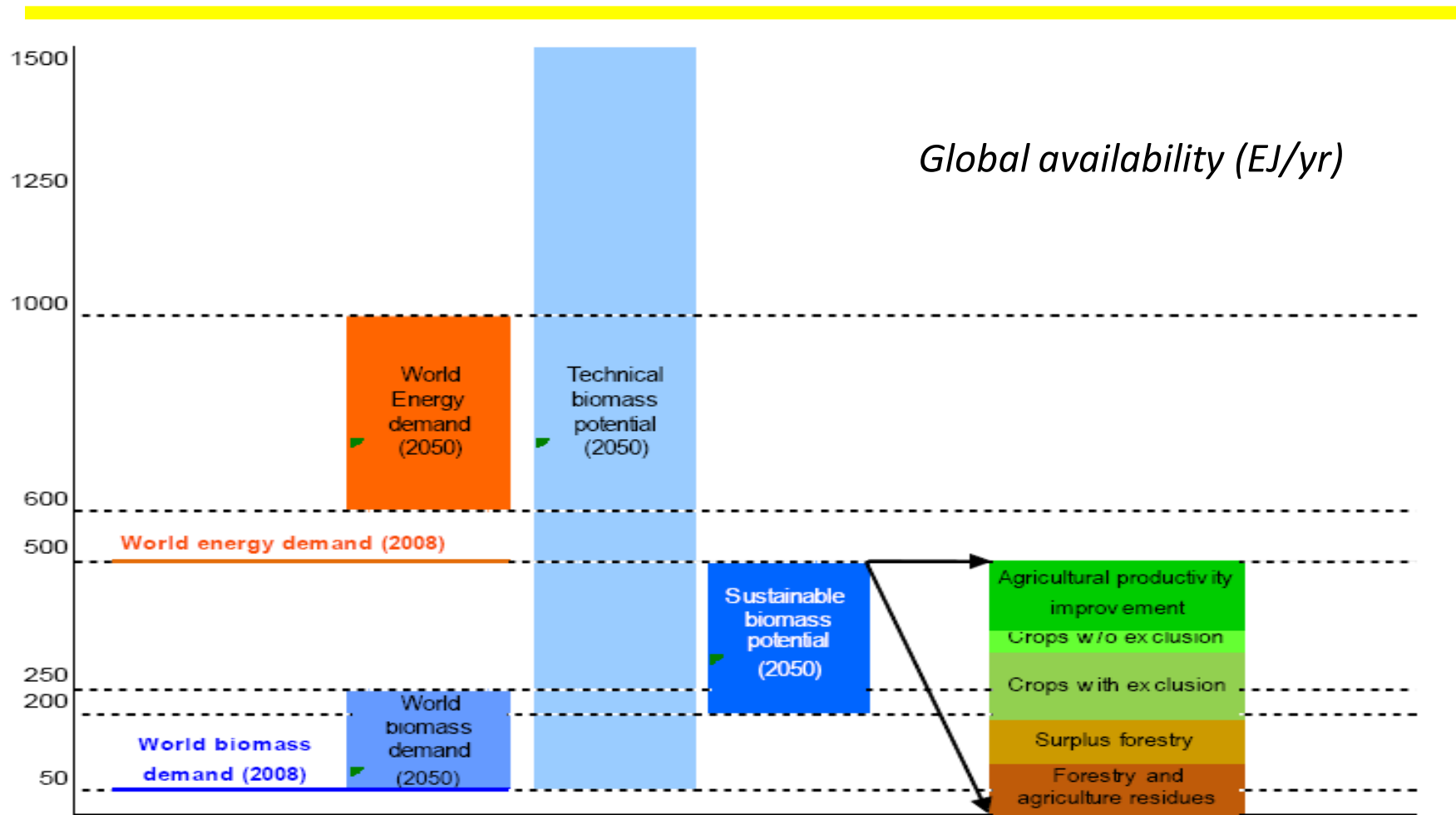
... but it's certainly a publicly sensitive issue!



"crime against humanity"



Is there enough biomass?



Huge potentials, major uncertainties

Type	Global potential 2050 (EJ)	Current use (EJ)
Forest residues	30 – 150	~40
Agricultural residues	15 – 70	~5
Dung	5 – 55	
Organic wastes (MSW)	5 – >50	~2
Cultivated crops (agricultural land)	0 – 700	Negligible
Cultivated crops (marginal land)	<60 – 110	
Total	<60 – >1100	50

Key uncertainties...

Issue/effect	Importance	Impact on biomass potentials
<i>supply as estimated in recent studies</i>		
<i>Supply potential of biomass</i>		
Improvement agricultural management	***	↑↓
Choice of crops	***	↓
Food demands and human diet	***	↑↓
Use of degraded land	***	↑↓
Competition for water	***	↓
Use of agricultural/forestry by-products	**	↑↓
Protected area expansion	**	↓
Water use efficiency	**	↑
Climate change	**	↑↓
Alternative protein chains	**	↑
Demand for biomaterials	*	↑↓
<i>demand as estimated in recent studies</i>		
<i>Demand potential of biomass</i>		
Bio-energy demand versus supply	**	↑↓
Cost of biomass supply	**	↑↓
Learning in energy conversion	**	↑↓
Market mechanism food-feed-fuel	**	↑↓

The Future for biomass - conclusion

- Biomass is necessary
- Enough biomass available
- With know-how how to apply it
- However, stable (better?) political frameworks are required

