

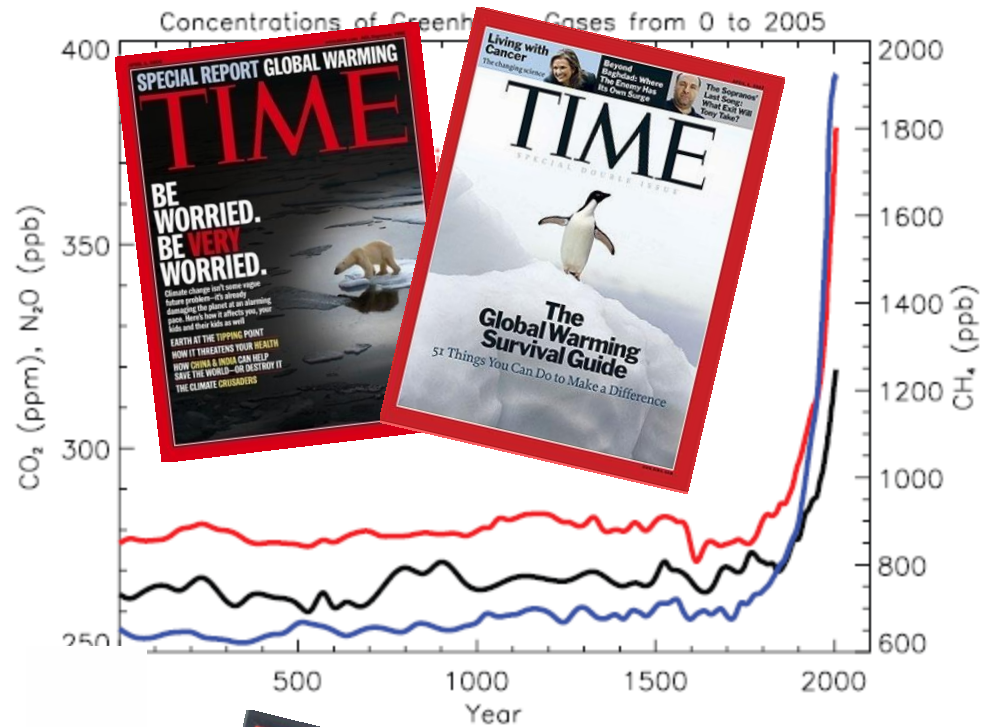
# **CROSS-COUNTRY COMPARISON OF DRIVERS, CHALLENGES AND OPPORTUNITIES FOR BIOENERGY**

Peter Ralevic, Jim Richardson, Tat Smith

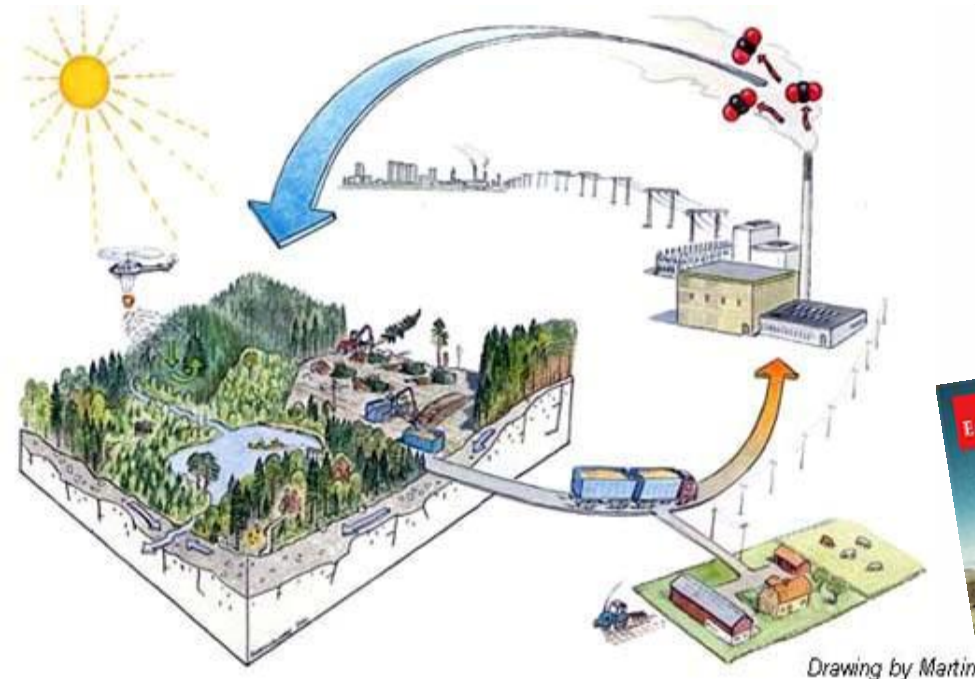
Task 31 Synthesis Paper  
IEA Bioenergy Conference  
August 23-26, 2009  
Vancouver, BC

# Today's big drivers

- Climate change
- Energy security
- Job creation and economy
- Environmental protection and sustainability
- **Role of forest bioenergy?**



(IPCC, 2007)



(IEA task 31)



(Domtar)

# Purpose of synthesis

- Develop a conceptual model that links the drivers and challenges to energy policy
- Synthesize the factors influencing bioenergy deployment

# IEA bioenergy task 31 member countries



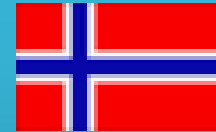
Finland



Germany



NL



Norway



Sweden



Denmark

EUROPE



UK



Canada



USA

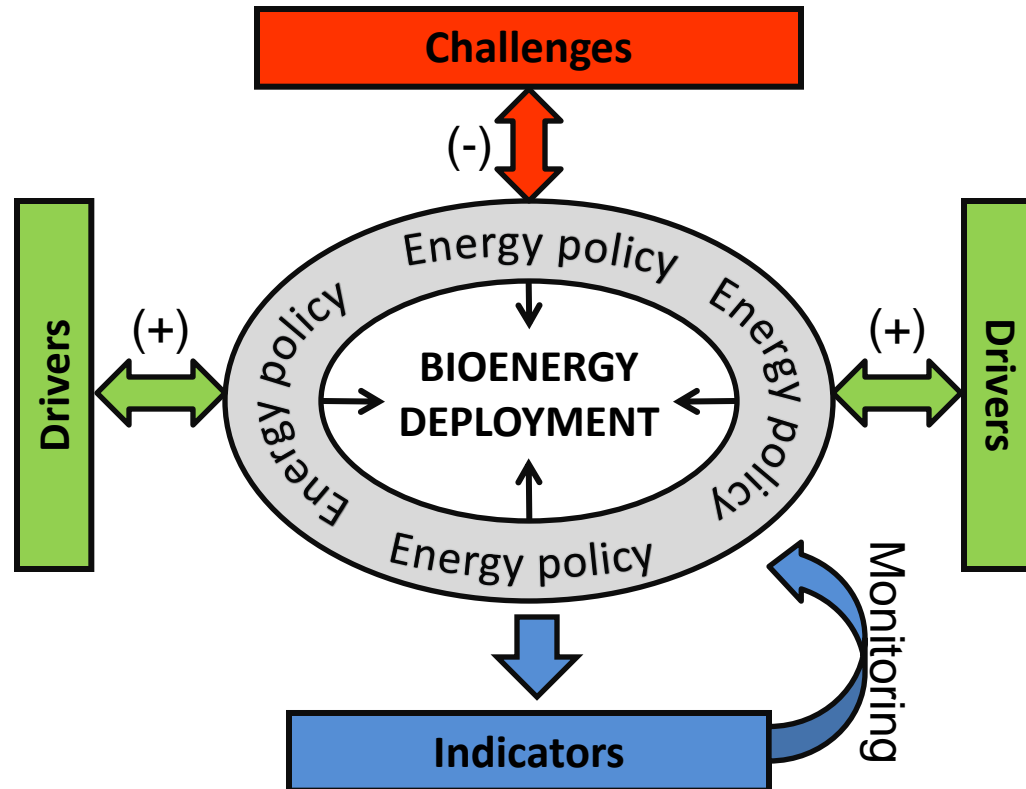
NORTH AMERICA

# Information sources

- IEA Bioenergy Task 31 country reports  
(available at <http://www.ieabioenergytask31.org/>)
- Various peer reviewed literature
- Energy indicators
  - Sources: European Commission, EUROSTAT (European Statistics Database), Statistics Canada, the International Energy Agency, and the Energy Information Administration of the US.
- Forest resource statistics
  - Sources: Ministries and UN FAO (FAOSTAT)
- Policy targets and action plans
  - Sources: The European Parliament, national white papers and proceedings, and government Biomass Action Plans and Strategies.



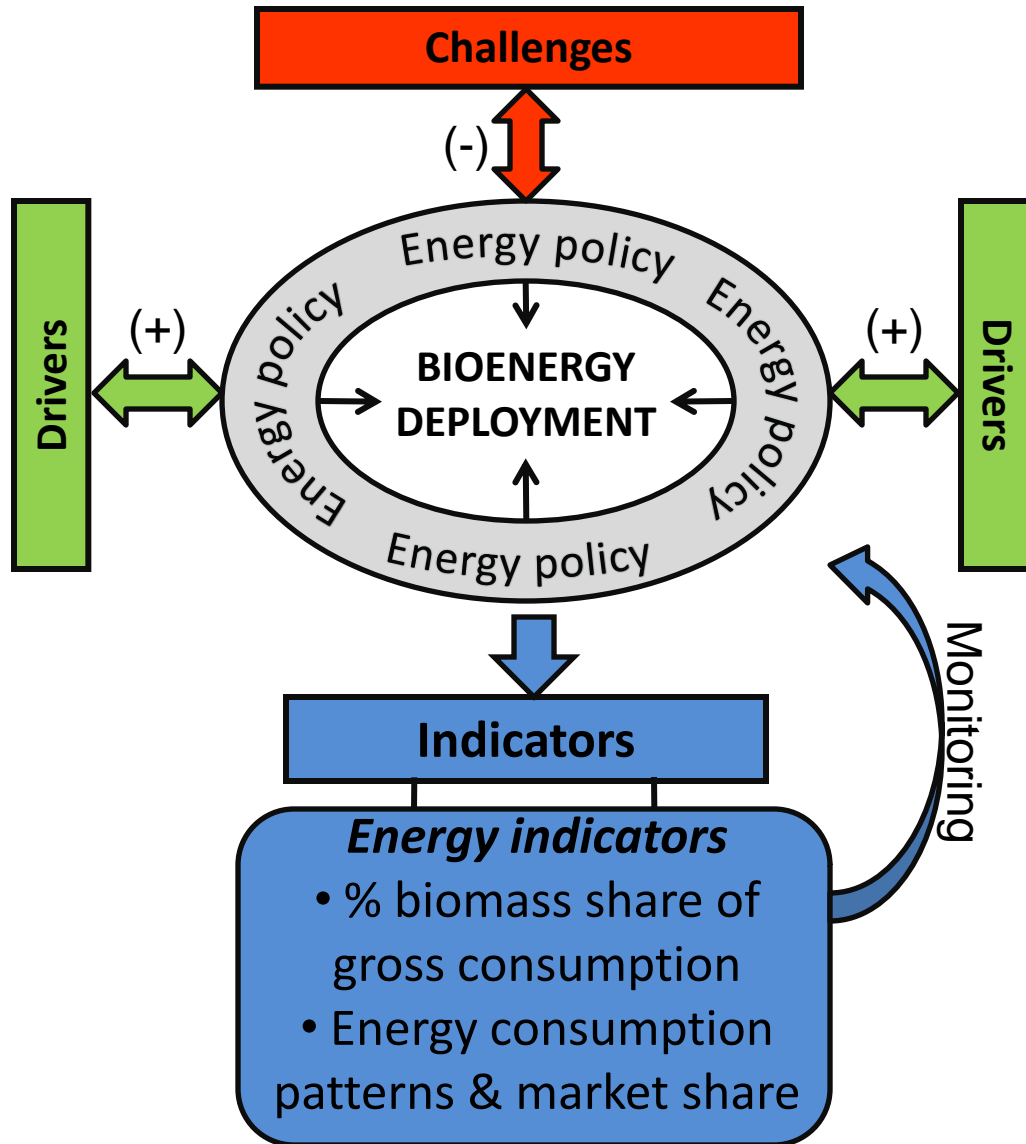
# The bioenergy deployment synthesis model



Adaptive framework context

- Policy evolves in response to measures of success or failure

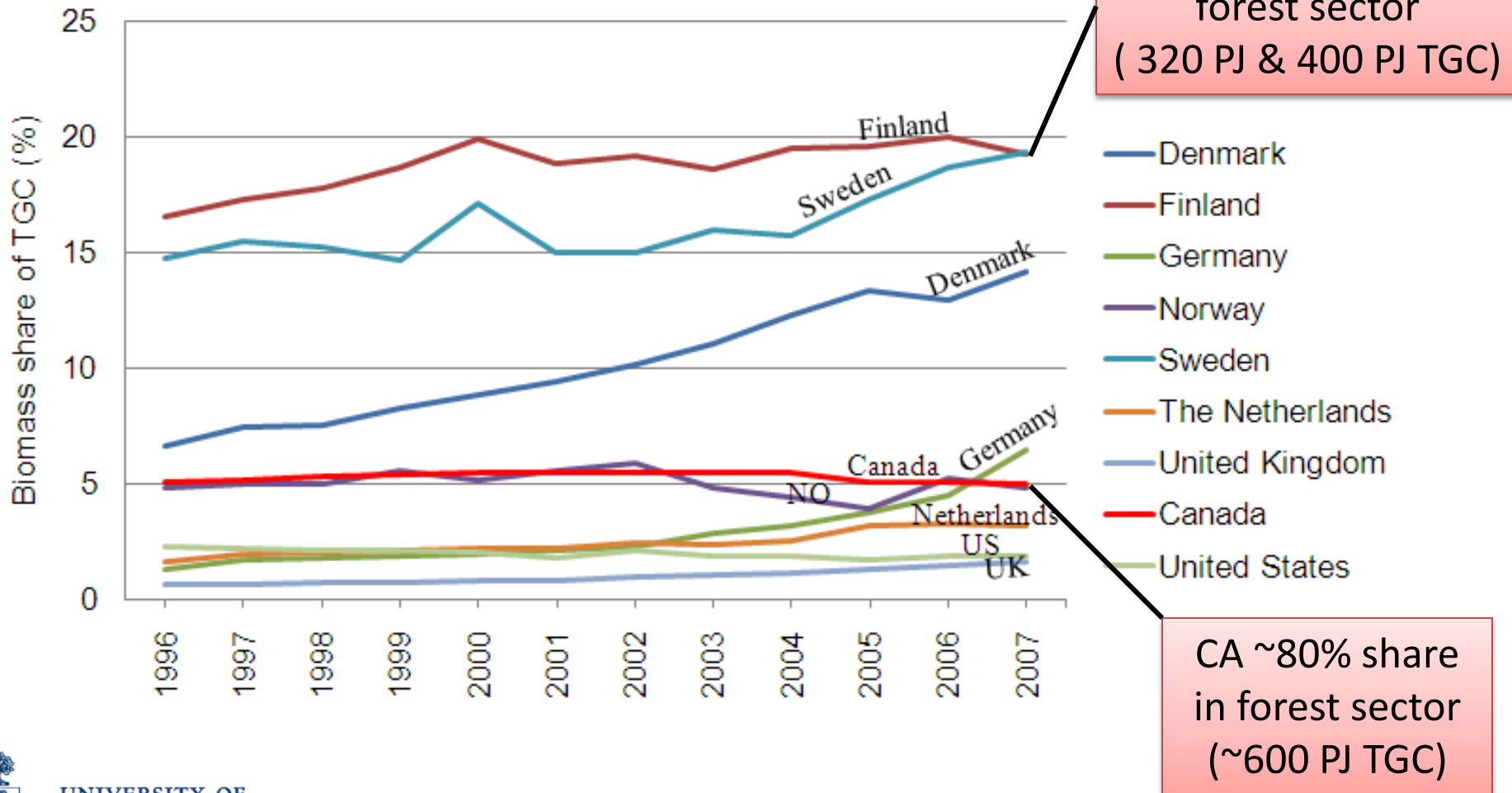
# Indicators





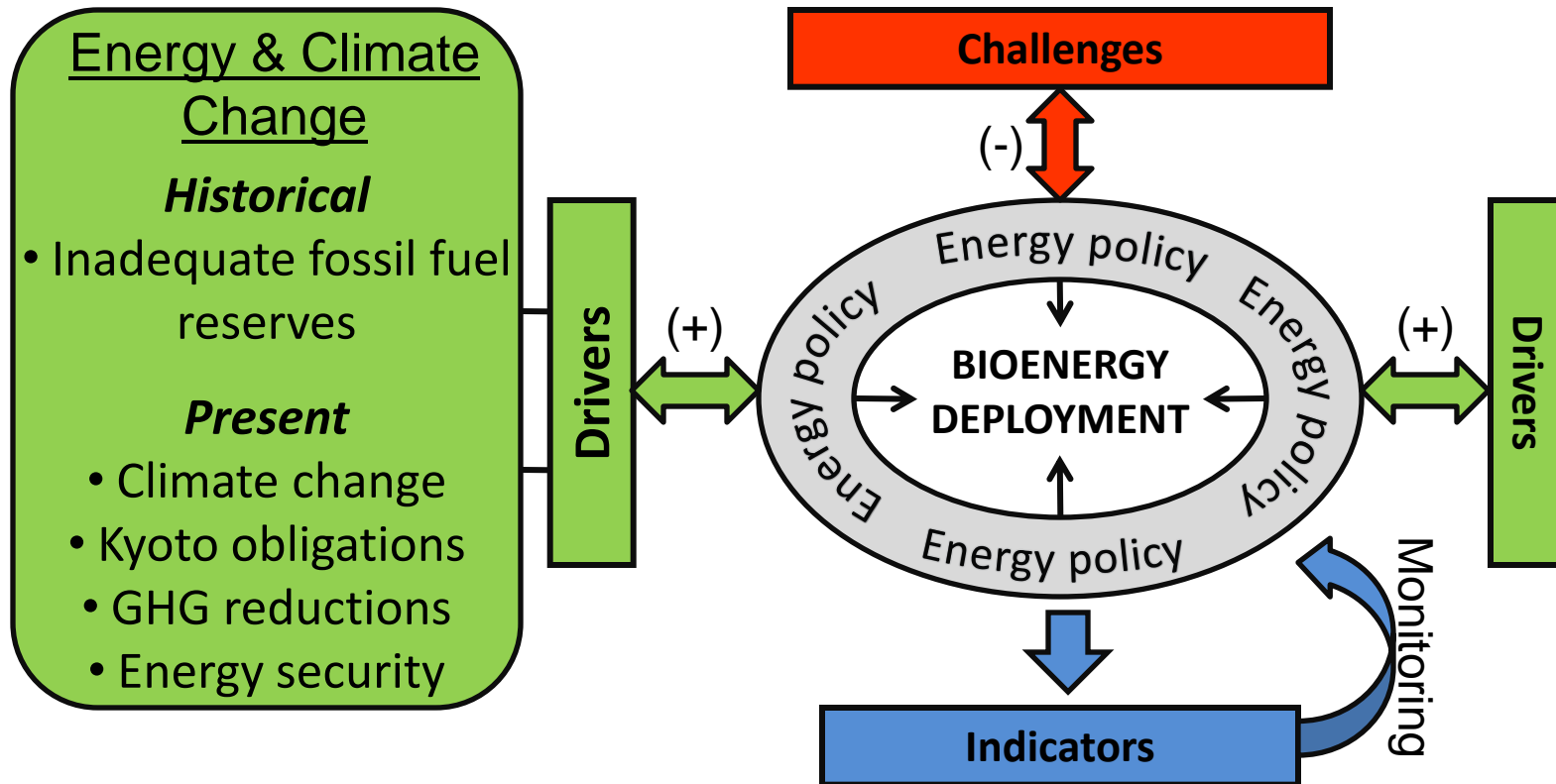
# Biomass share

- Variable biomass shares

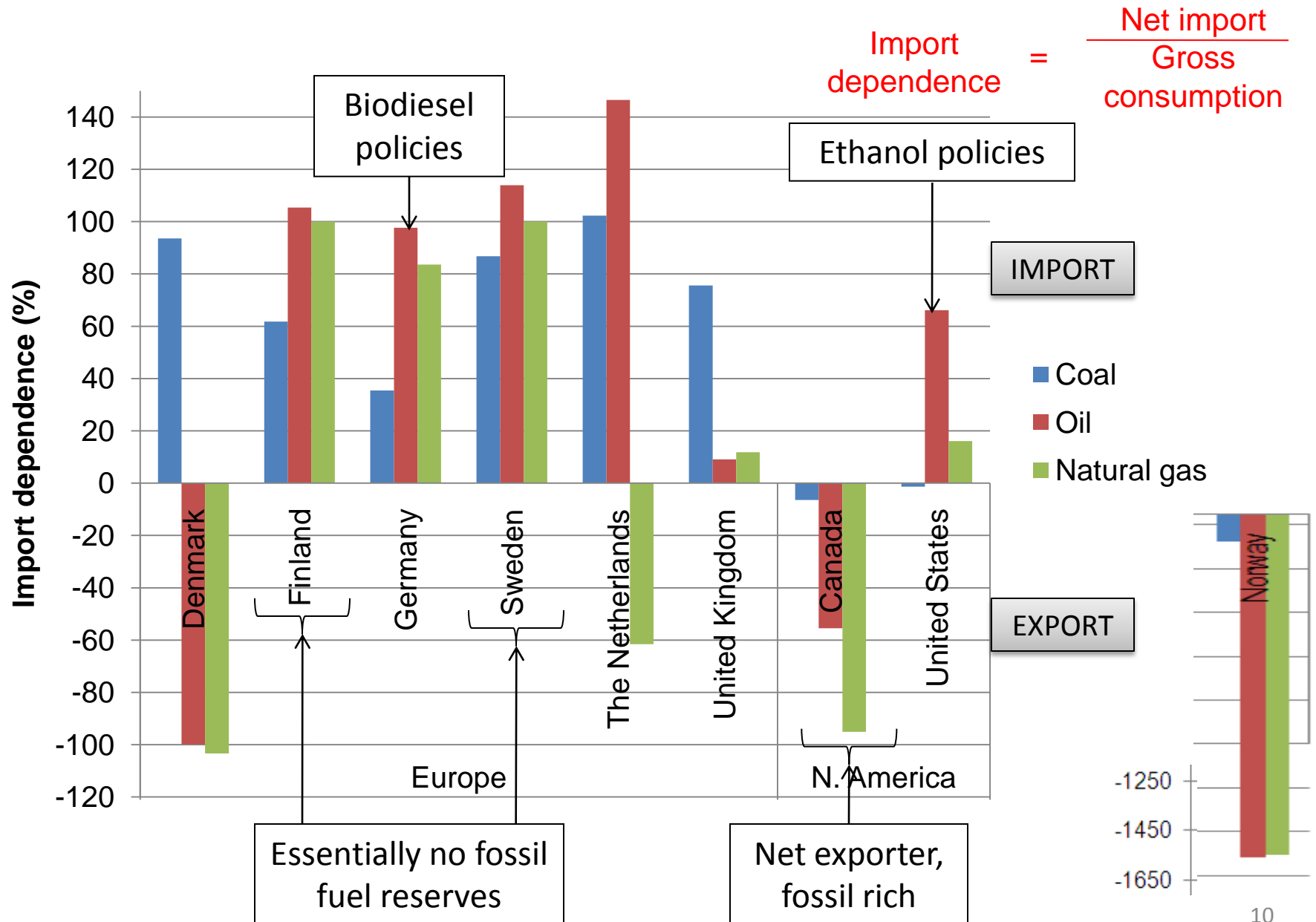




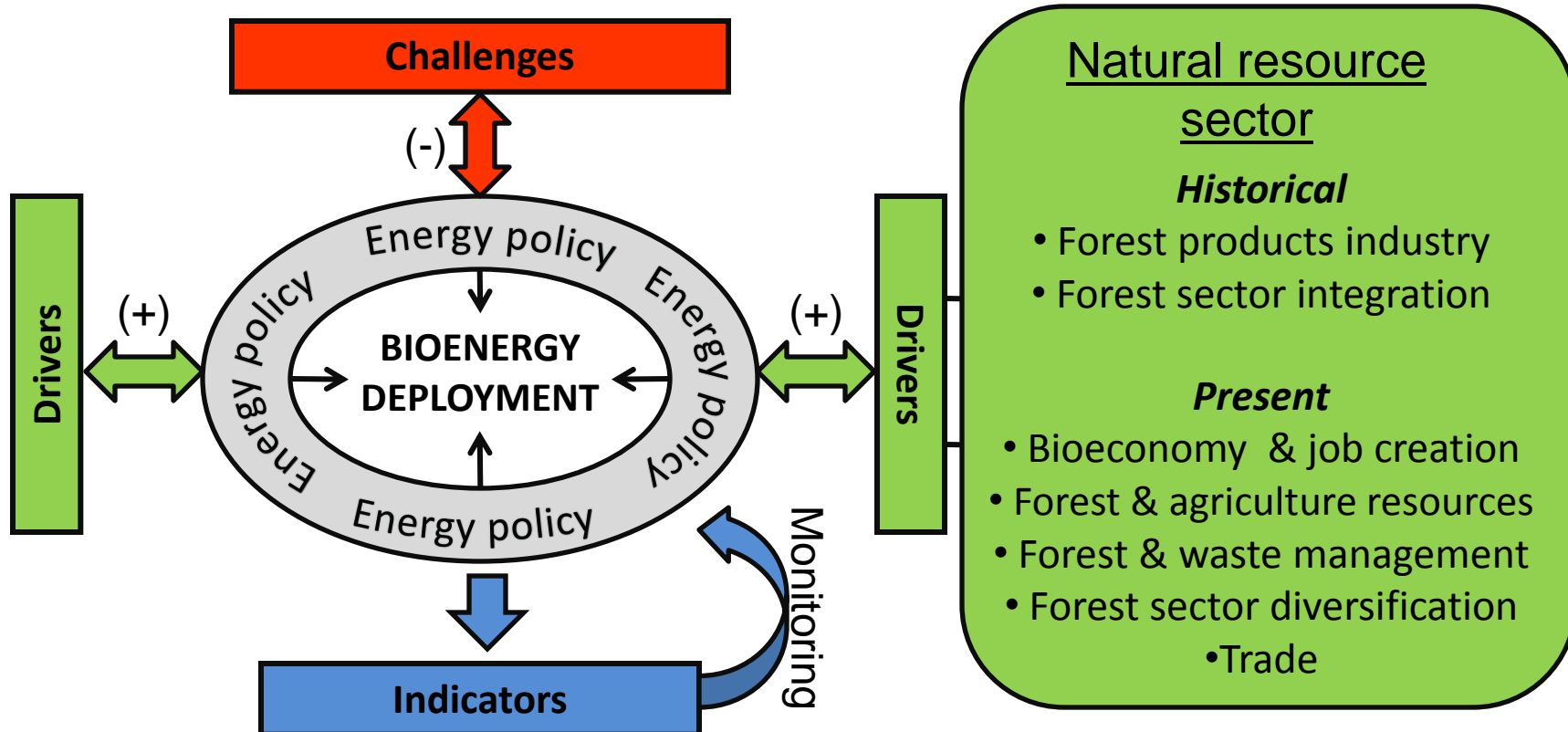
# Drivers - 1



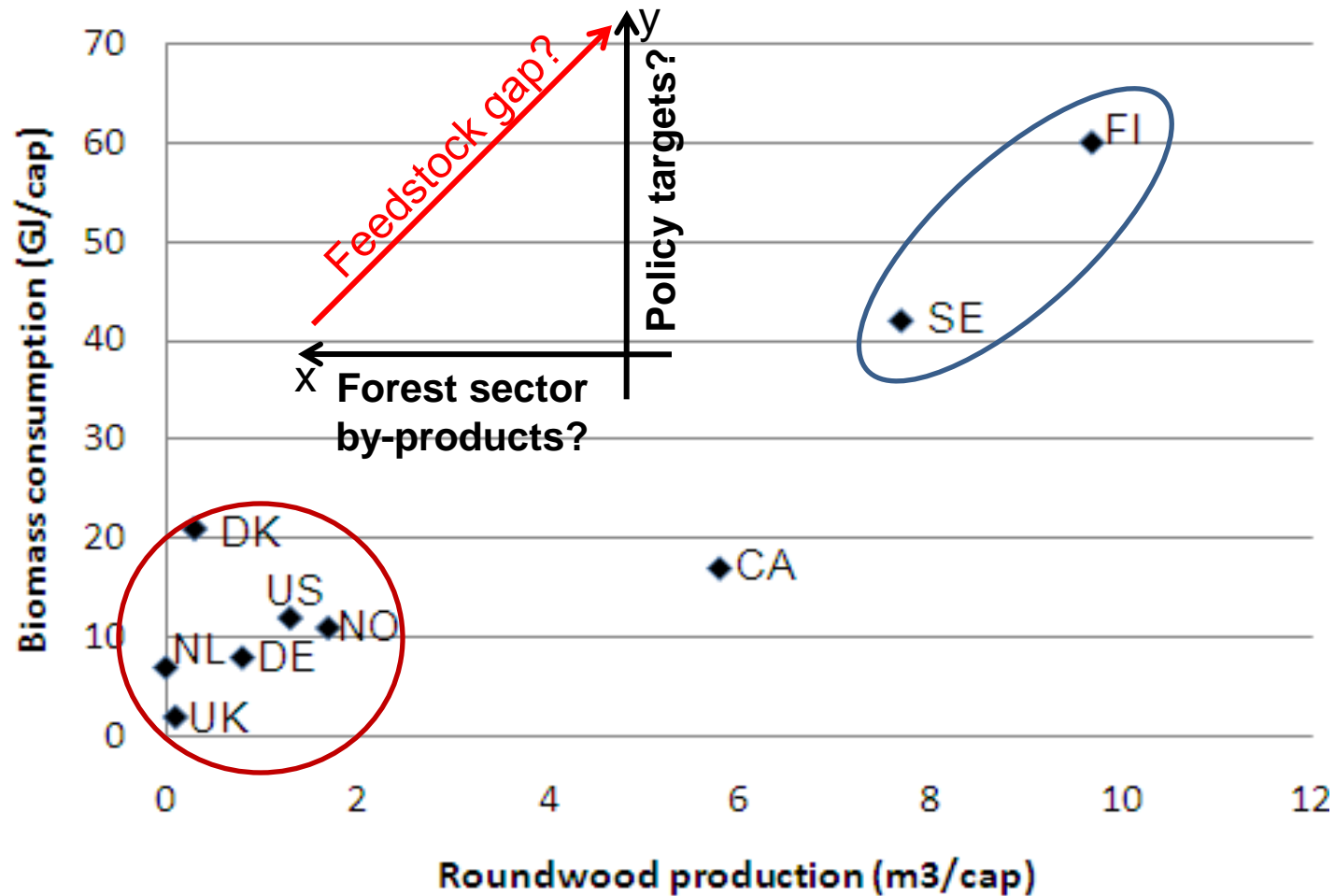
# Energy security: Import dependence



# Drivers - 2



# The forest sector and bioenergy



What potentially significant change will be required?

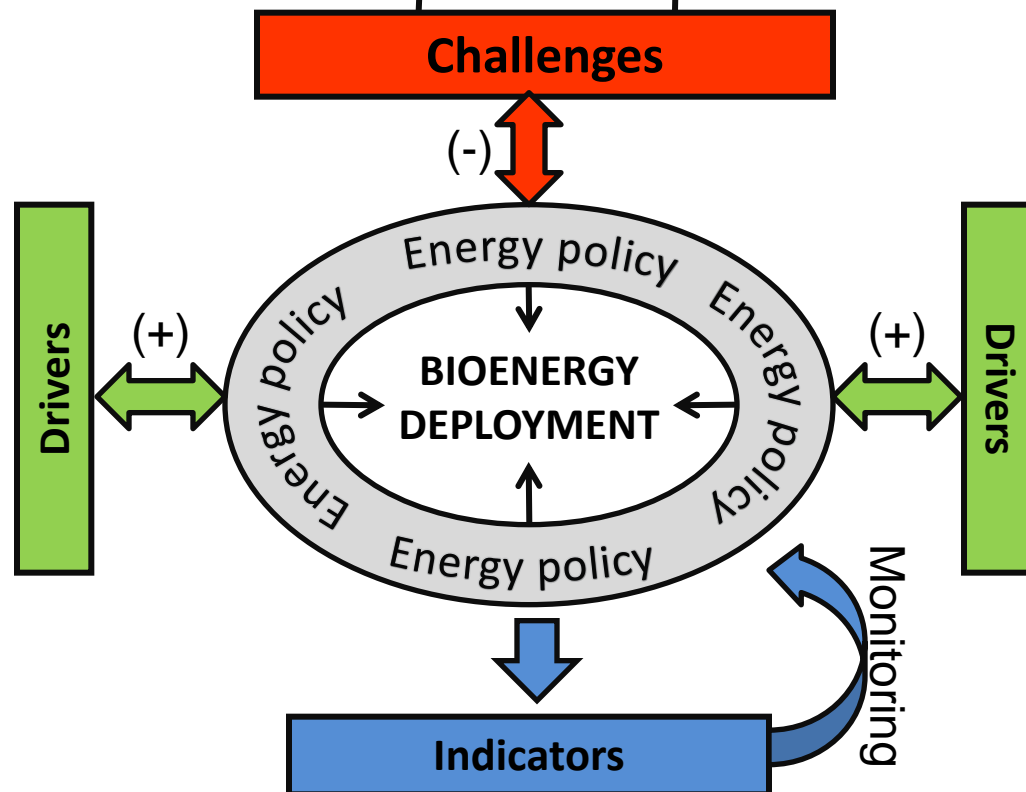
# Challenges

## *Historical*

- Abundant fossil fuels 'cheapest energy'
- Industrial Revolution

## *Present*

- Non-technical: Economic competitiveness, feedstock supply, regulations, logistics & infrastructure, knowledge & skills
- NGO/public concerns - environmental sustainability, land use
- Technology – low efficiency, quality, reliability, maturity



# Feedstock supply

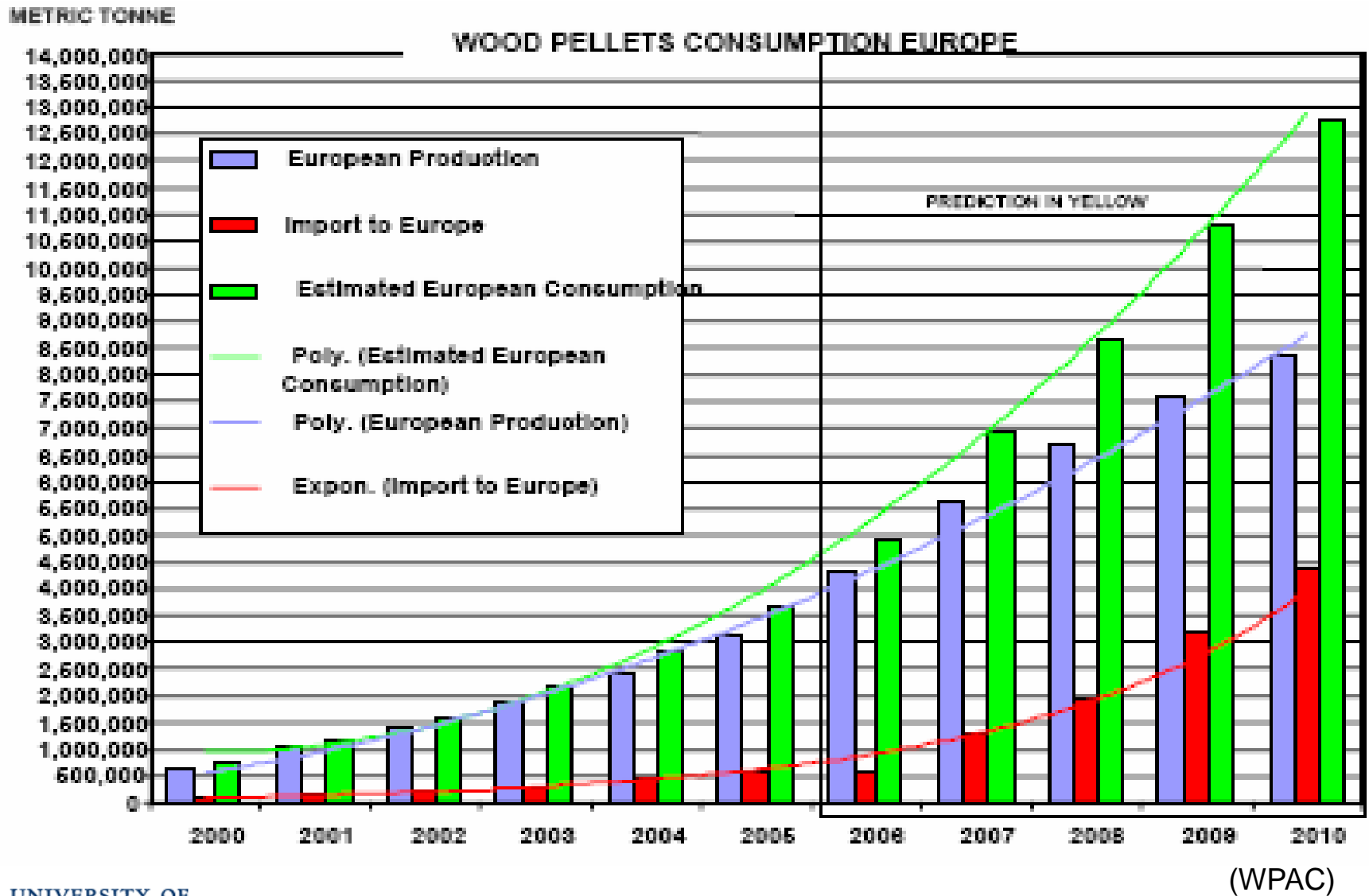
- **Challenges**

- Growing competition for domestic fibre (FI, SE, CA)
- Limited forest resources (DE, NL, UK;  $<0.15$  ha/cap)

- **Opportunities**

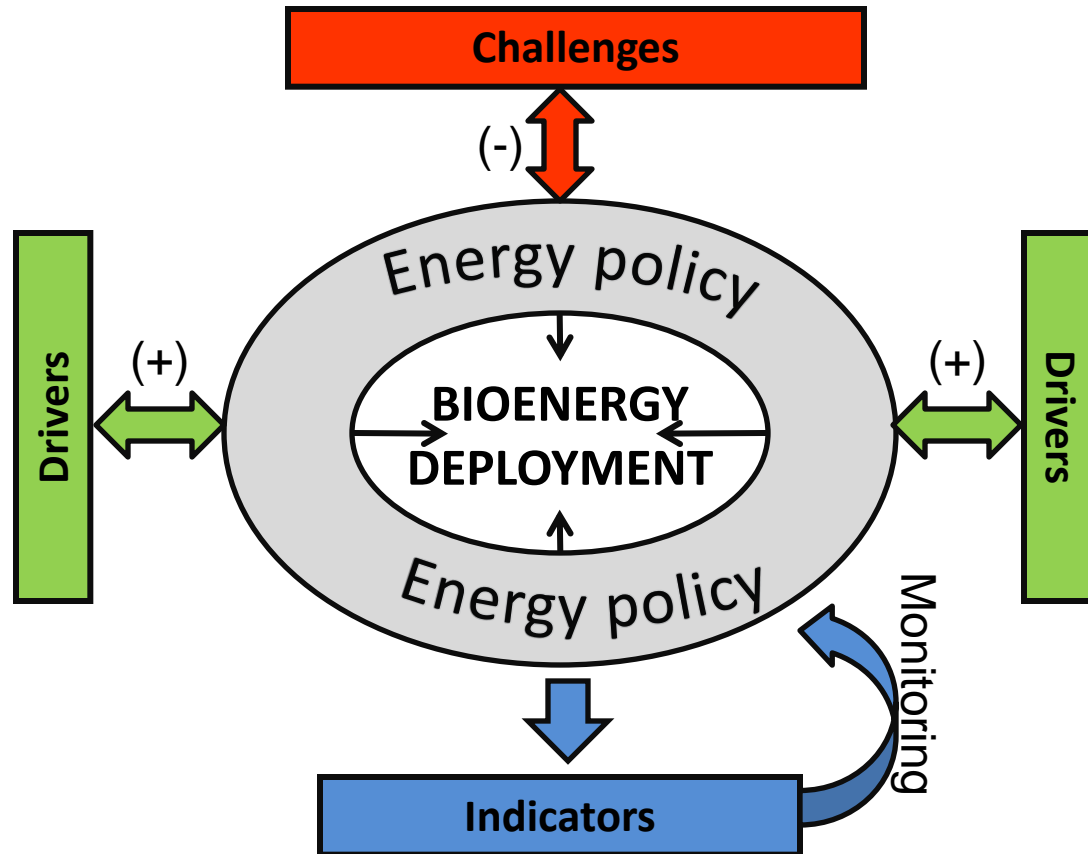
- More efficient recovery of logging residues (FI, SE) for additional fibre
- Increasing import to meet targets (International market)

# Increasing trade: Europe





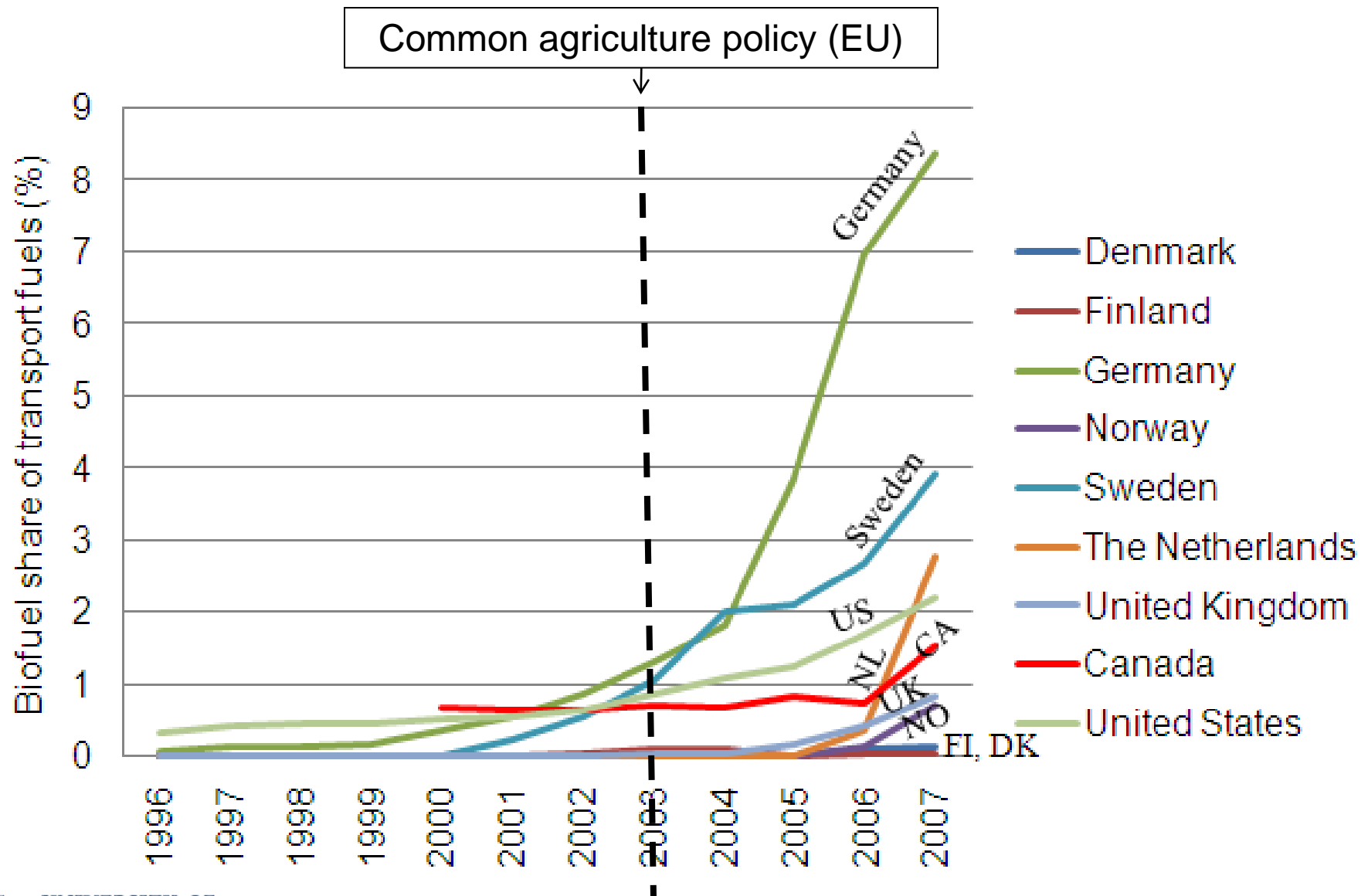
# Energy policy



# Bioenergy policies

Country	Main strategy	Biomass and bioenergy target	Biofuels target
Denmark	Heat, power, CHP, and/or district heating	-	5.75 % share by 2010
Finland		Double to 415 PJ by 2025 from 1995	
Germany		Double power gen. to 25% by 2020 (CHP)	
Netherlands		Double to 200 PJ by 2020 from 2006	
Norway		Double to 100 PJ by 2020 from 2006	
Sweden		50% increase to 576 PJ by 2010 from 2006	
United Kingdom		348 PJ future potential (150 PJ present use)	5% share by 2010
Canada		None	
United States	Ethanol (corn and cellulose)	5% of nation's power and 25% chemicals by 2030	13% share by 2010, 30% share by 2030

# The policy factor: Agriculture

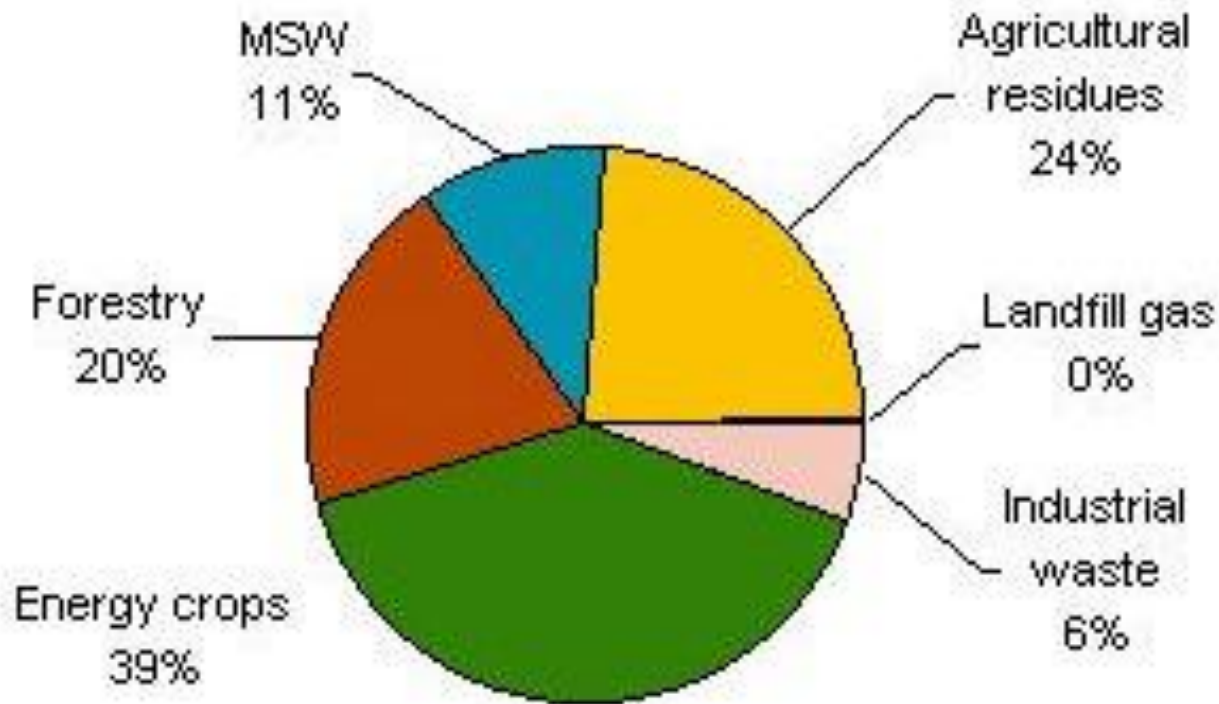


(EC, 2005; EIA, 2008; EUROSTAT, 2009)

# Future biomass resources

Projected biomass resources distribution in EU 15 in 2030

- Biomass potential - 4 200 PJ by 2010, 5 000 PJ by 2030



(Jorgensen and van Dijk)

# Conclusions

- A complex multi-directional network of drivers and challenges influence energy policy resulting in bioenergy deployment
- Need for clear policy targets and economic incentives
- Trade in wood biomass will likely grow, key opportunity
- Cross-sectoral issues are becoming significant
  - Indirect land use change
  - Food vs. fuel vs. fibre
  - USA housing starts & CAN forest sector vitality



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**THANK YOU!**

**Questions?**