

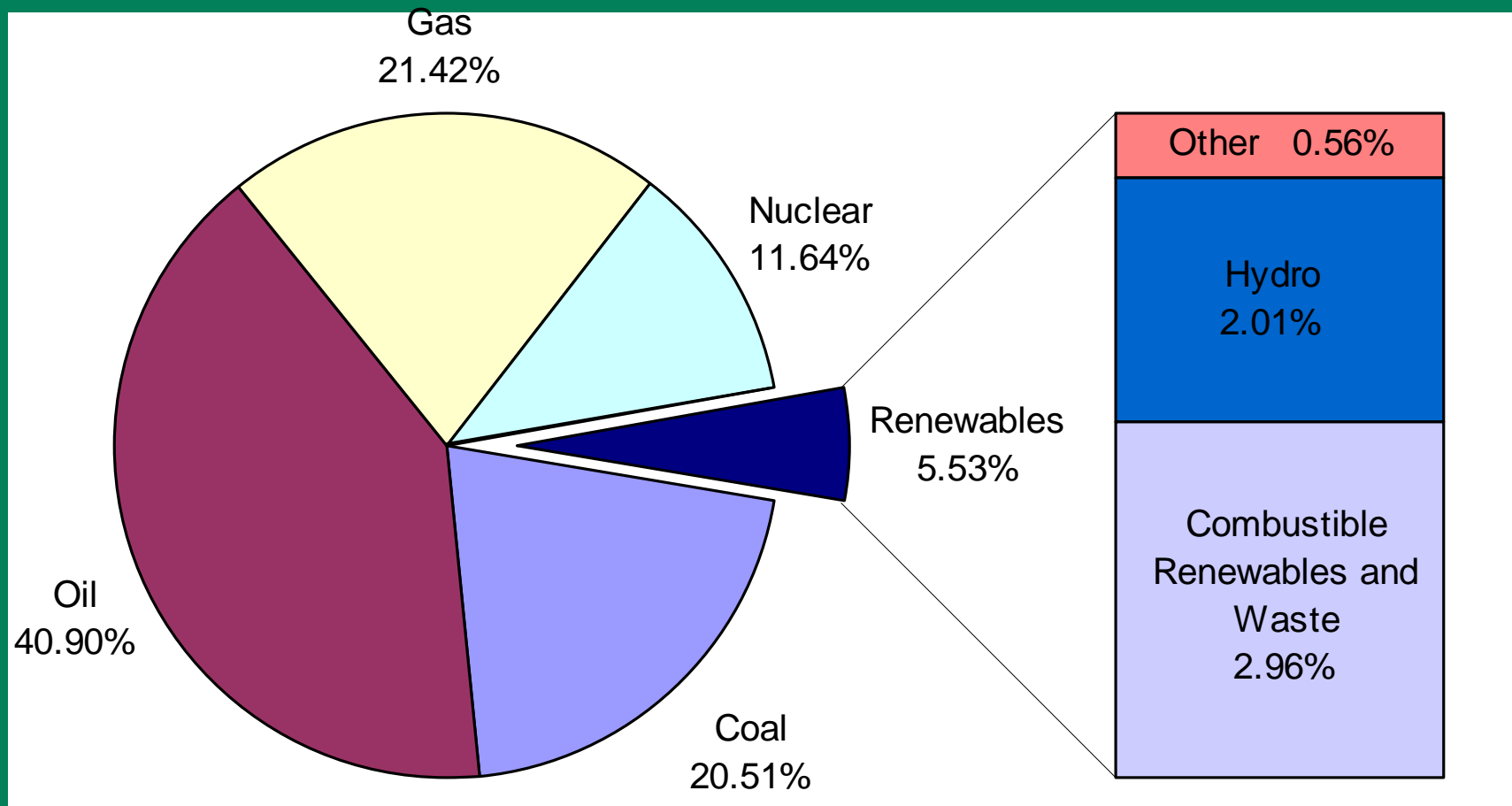
**Bioenergy:
a complex matrix, full of
opportunities – and dependent
on policy instruments**

Kyriakos Maniatis

European Commission

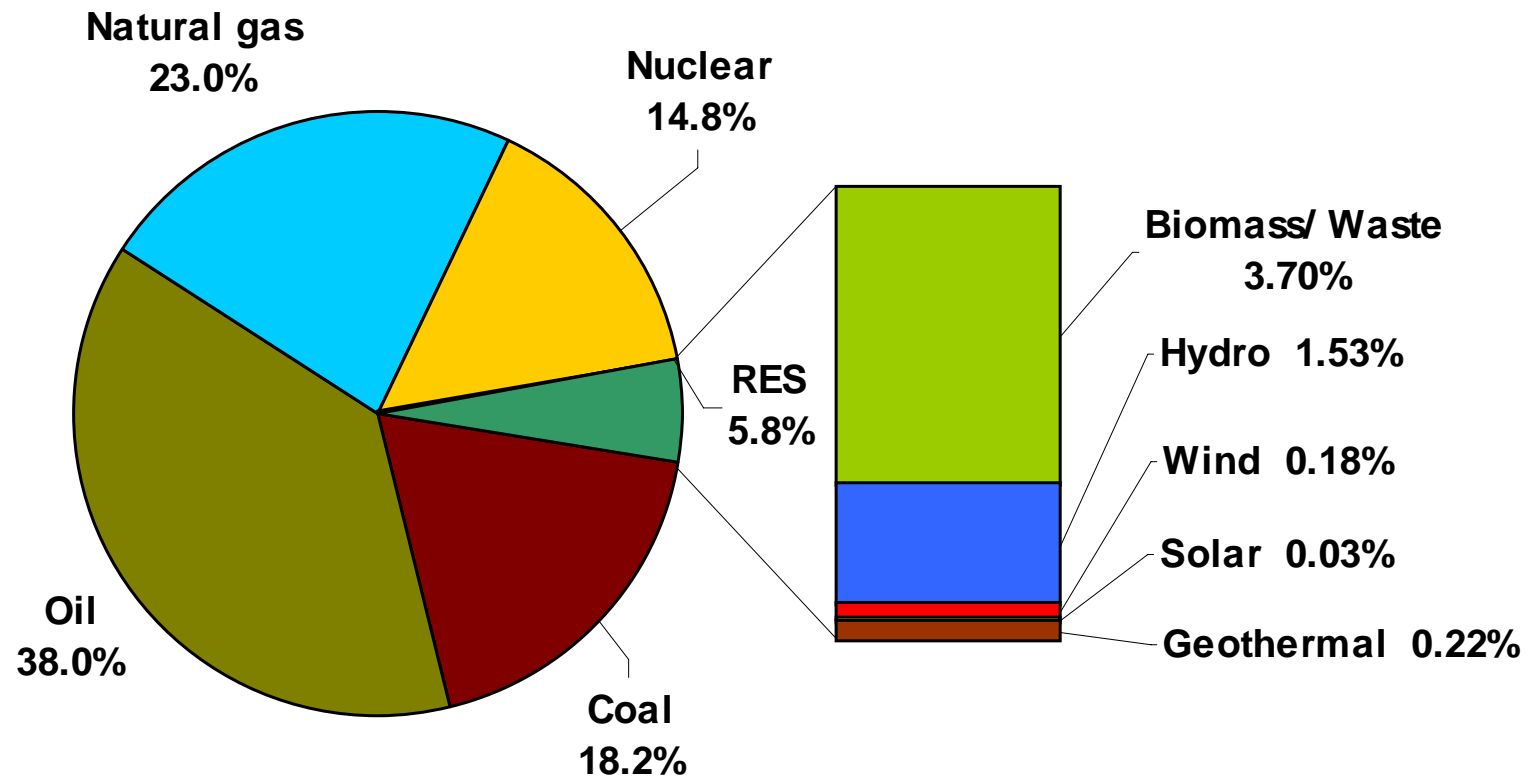
Directorate General for Energy & Transport

OECD 2001 Fuel Shares of Total Primary Energy Supply

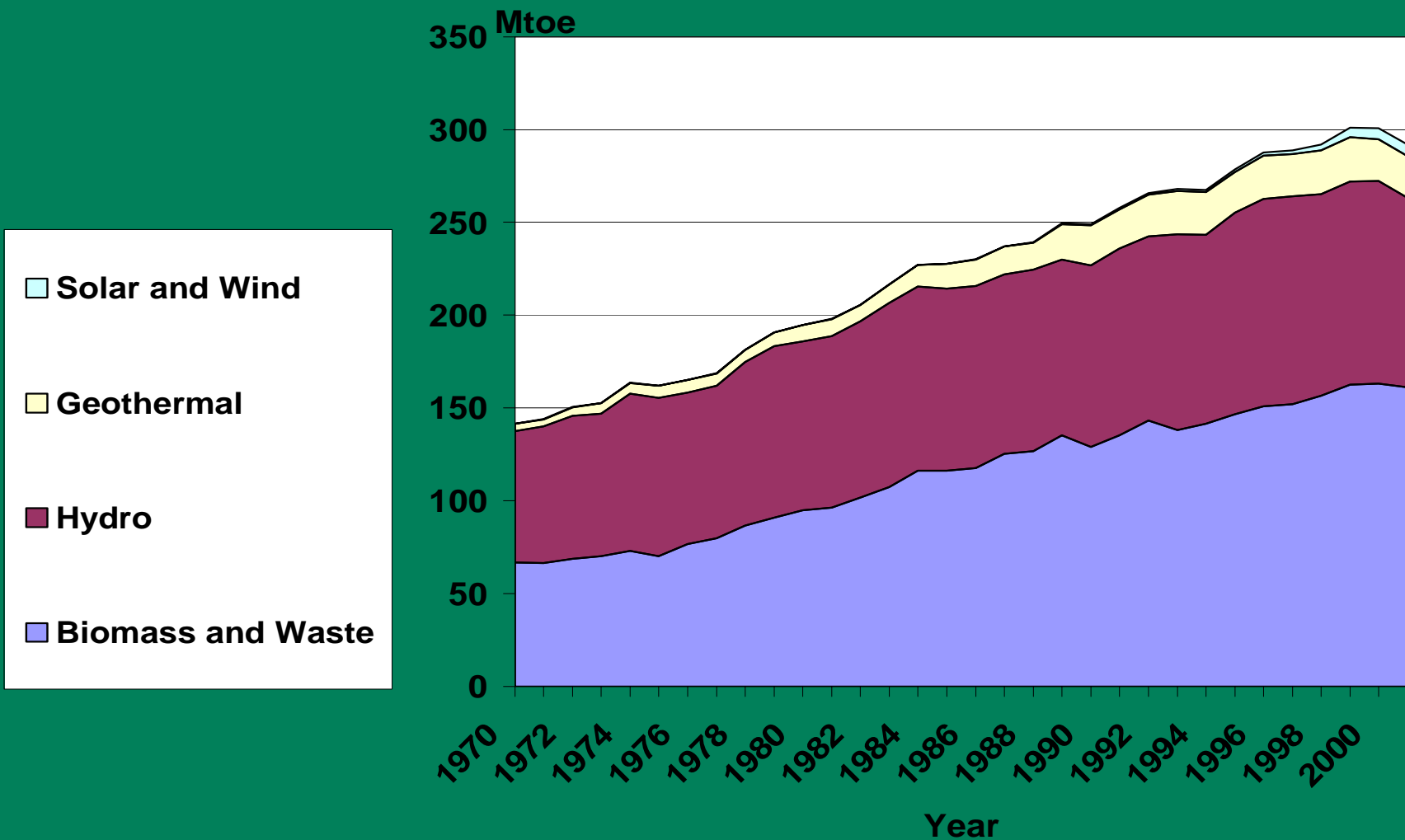


Gross Energy Consumption

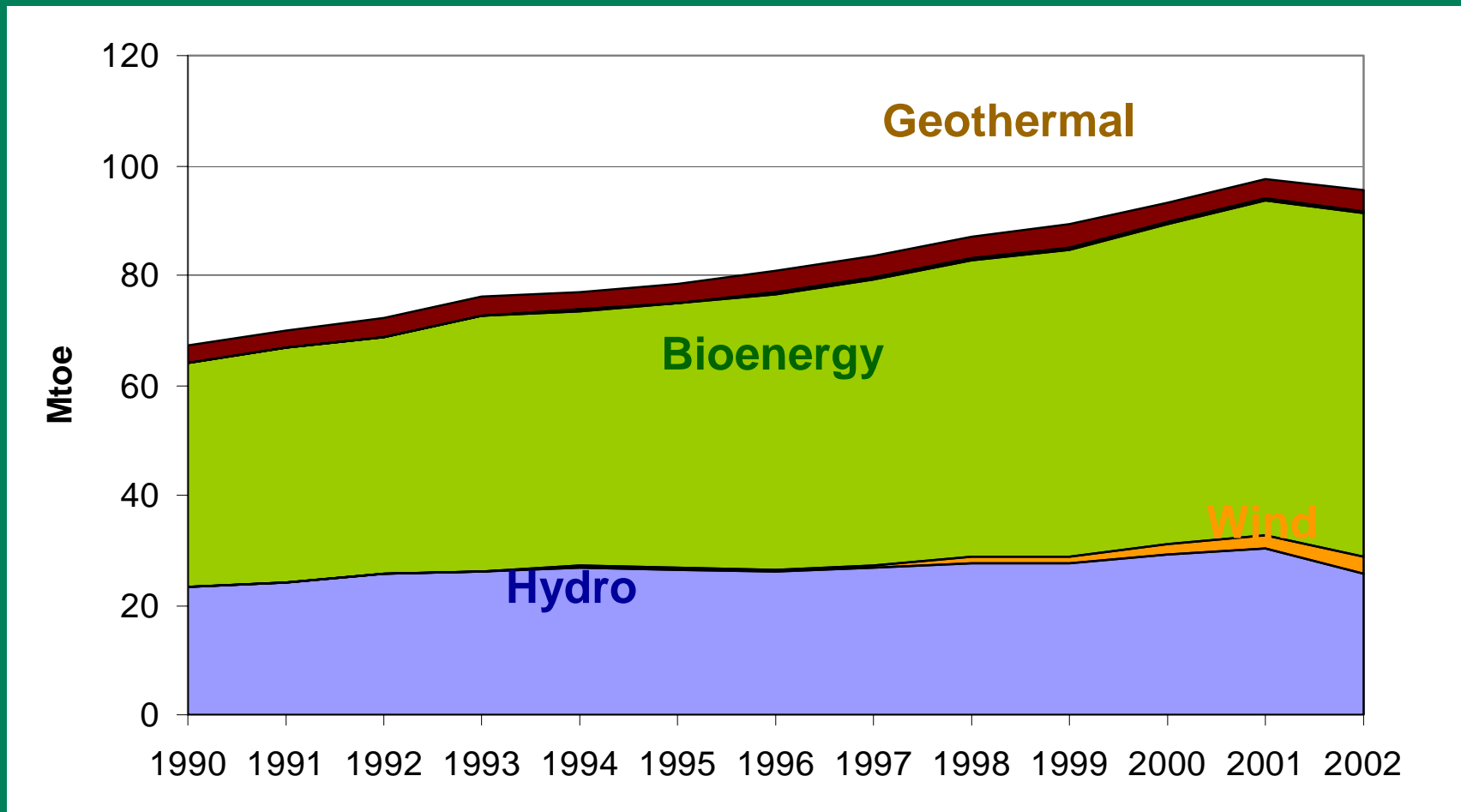
EU25, 2002



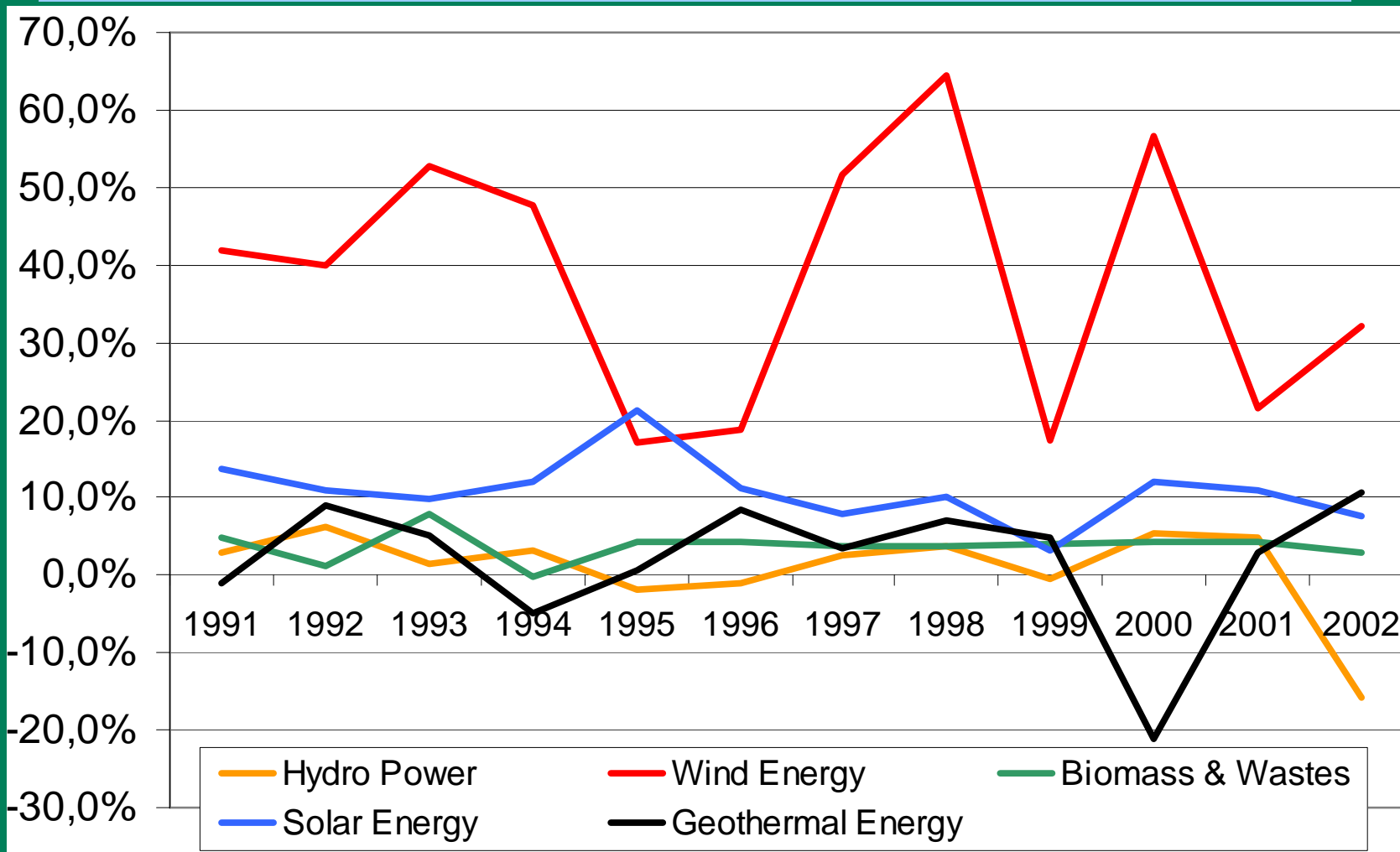
OECD RES Energy Primary Energy Supply, 1970-2001



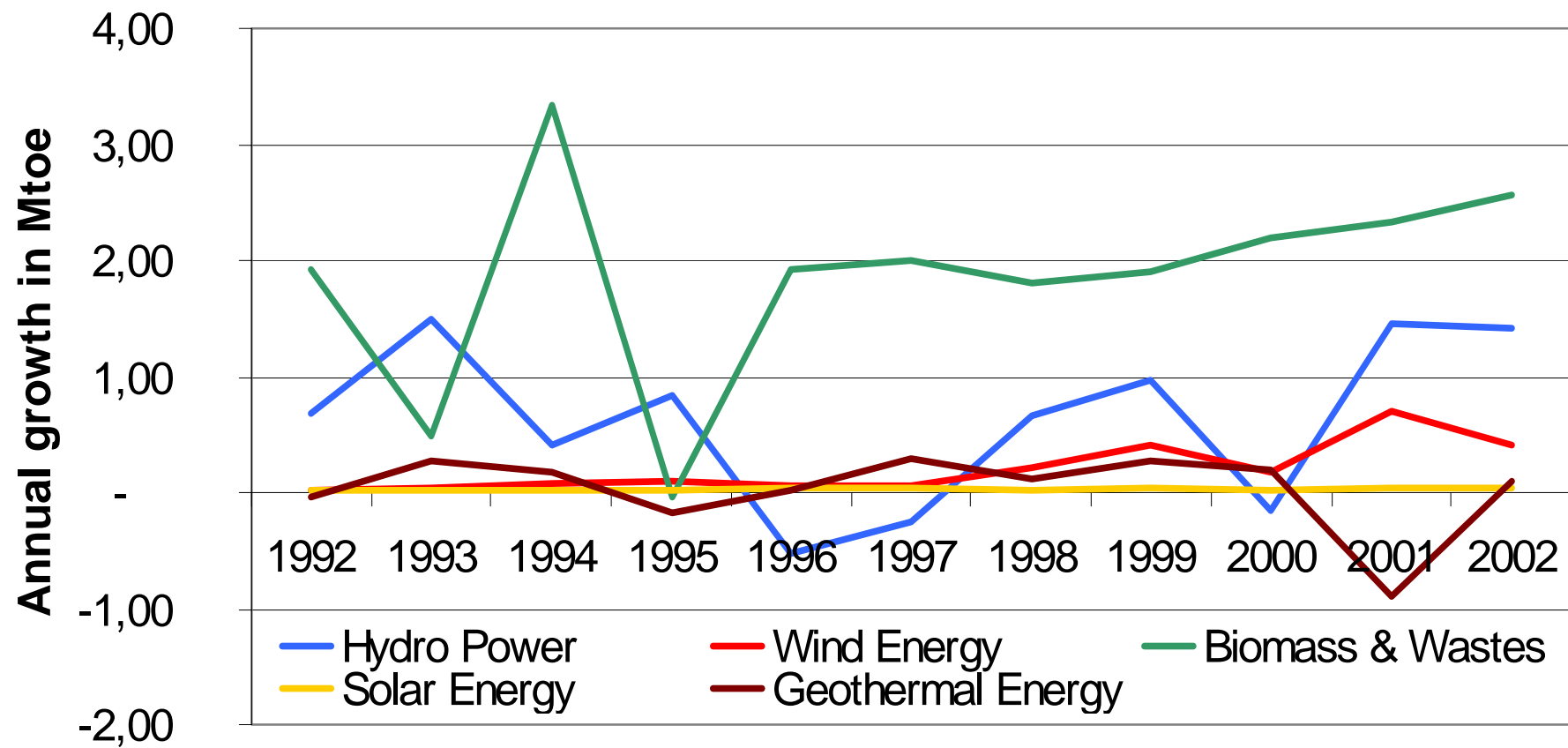
EU25, 1990-2002, Renewables only



EU25, 1990-2002, Annual RES growth rates

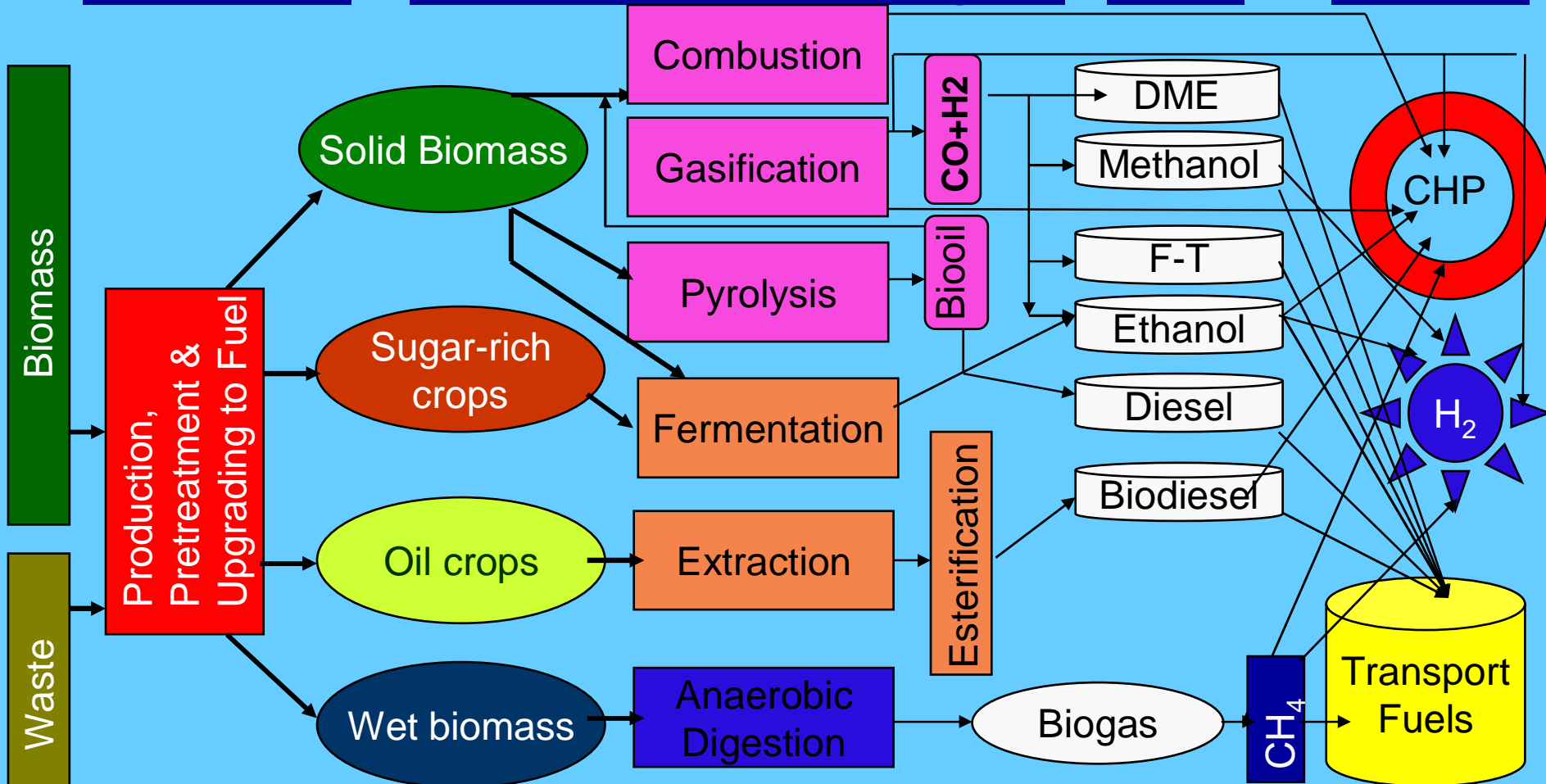


EU25, 1990-2002, Annual RES growth in Mtoe



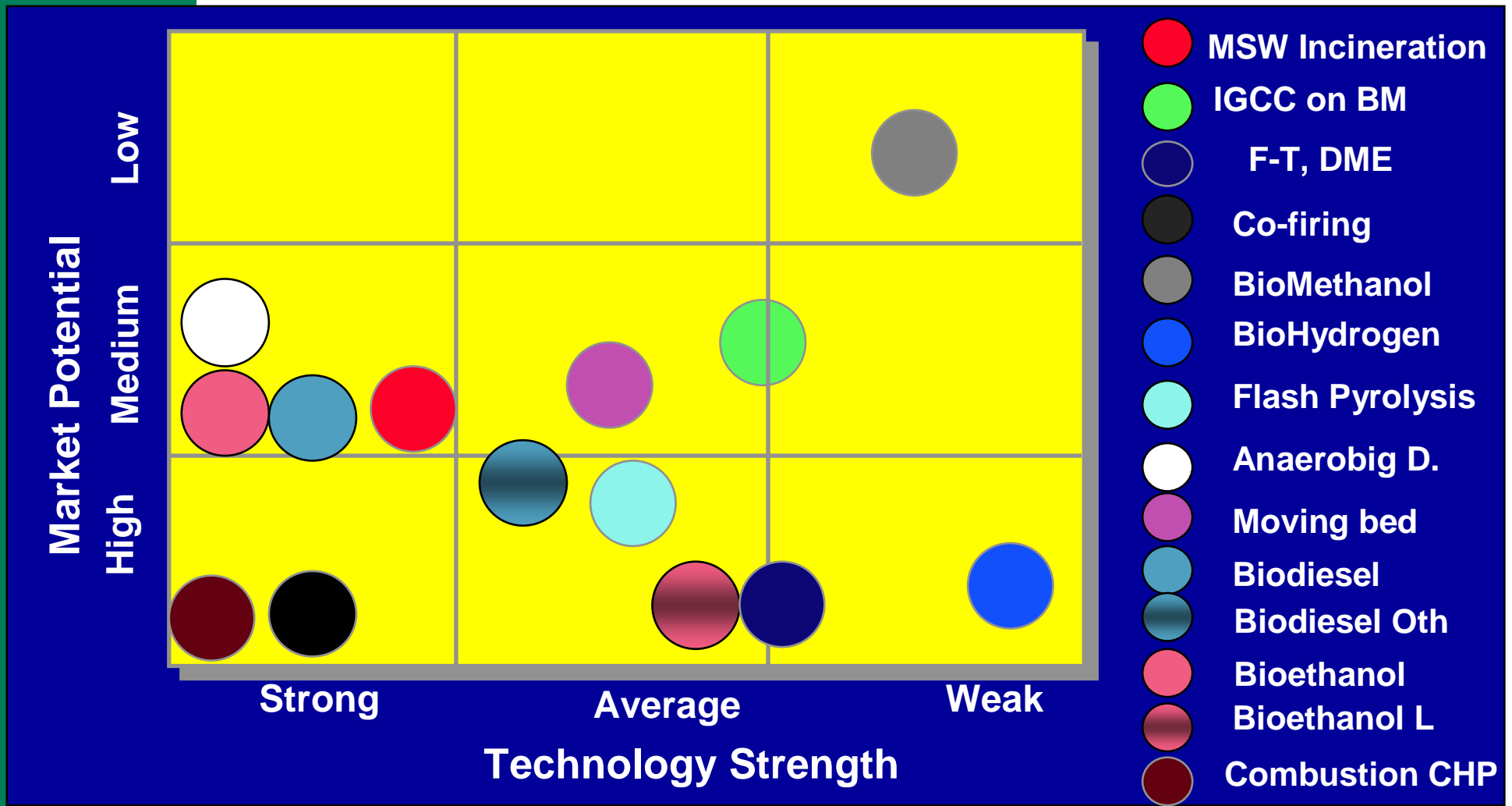
Overview Conversion Pathways

Resources Conversion Technologies Fuels Markets



Source: DG TREN

STATUS OF PROCESSES & APPLICATIONS



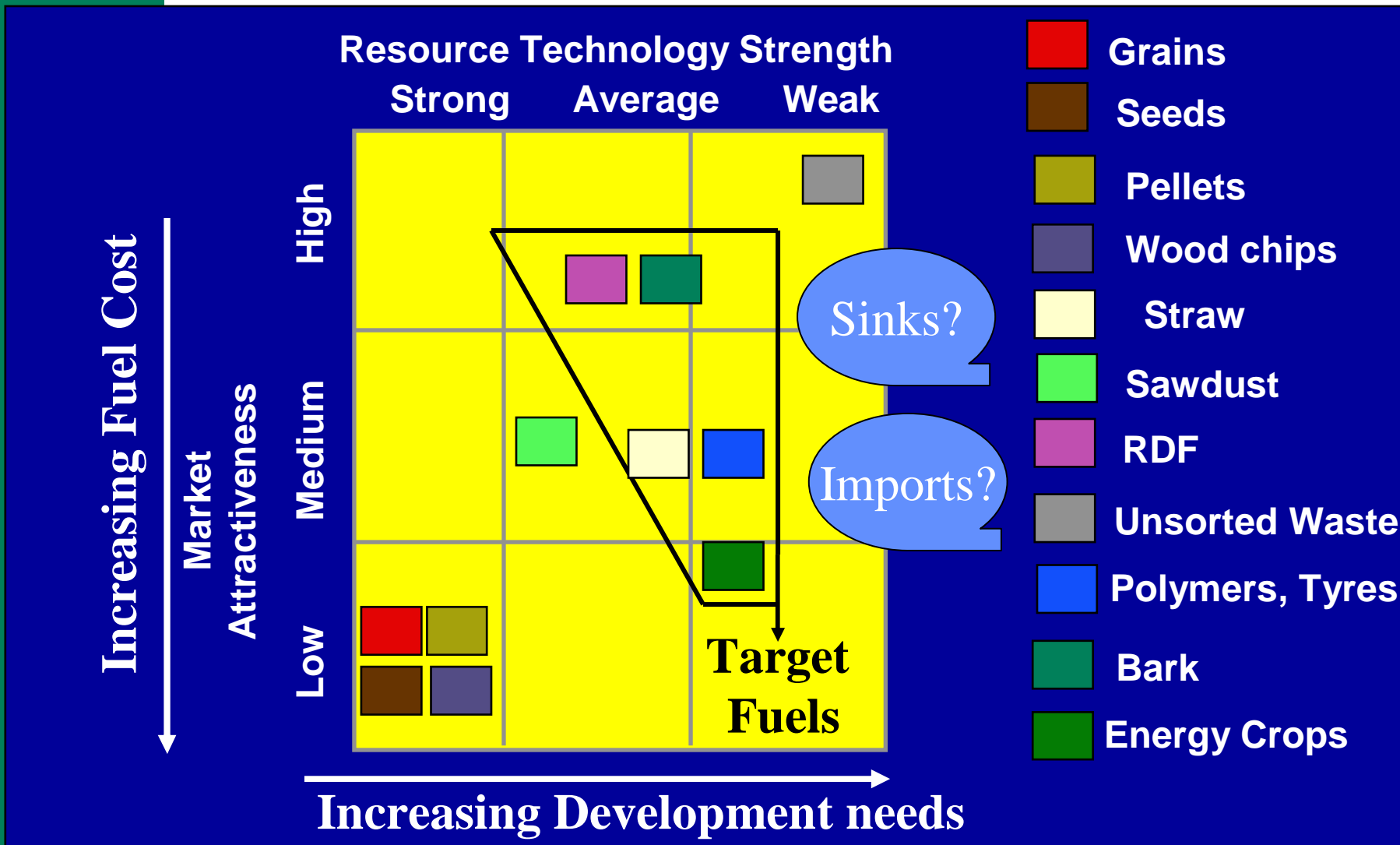
- MSW Incineration
- IGCC on BM
- F-T, DME
- Co-firing
- BioMethanol
- BioHydrogen
- Flash Pyrolysis
- Anaerobic D.
- Moving bed
- Biodiesel
- Biodiesel Oth
- Bioethanol
- Bioethanol L
- Combustion CHP

TECHNOLOGY – MARKET OPPORTUNITIES & DEVELOPMENT

| | Existing Technology | New Technology |
|------------------|---|---|
| Existing Markets | <p>Market Penetration</p> <p>District heating Clean Waste Fuels + BM CHP Biogas (farm residues)</p> | <p>Product Development</p> <p>IGCC - 30-75 MWe Gasification 1-5 MWe BioEthanol from Lignocel. Bio-Methanol, F-T, DME</p> |
| New Markets | <p>Market Development</p> <p>Co-Firing with coal Biogas (crops, waste) Bio-Oil for Heat & Power Biofuels for transport Household heating</p> | <p>Diversification</p> <p>Bio-H2 BioChemicals BioMaterials</p> |

Resources???

RESOURCES DEVELOPMENT for Biofuels applications



- **Bioenergy has the highest potential amongst all RES & is the only RES that can directly replace fossil fuels.**
- **Significant costs reductions have been achieved in the past due to technology development and much more can still be achieved. Proportionally Bioenergy has received low financial support.**
- **Exploitation of Bioenergy's full potential primarily depends on policy rather than on technology development.**
- **New policy instruments influencing market conditions open new opportunities for R&D.**