

# Global (International) Energy Policy and Biomass

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California Biomass Collaboration – First Annual Forum  
January 8<sup>th</sup> , 2004  
Sacramento, CA.



# Understanding Policy

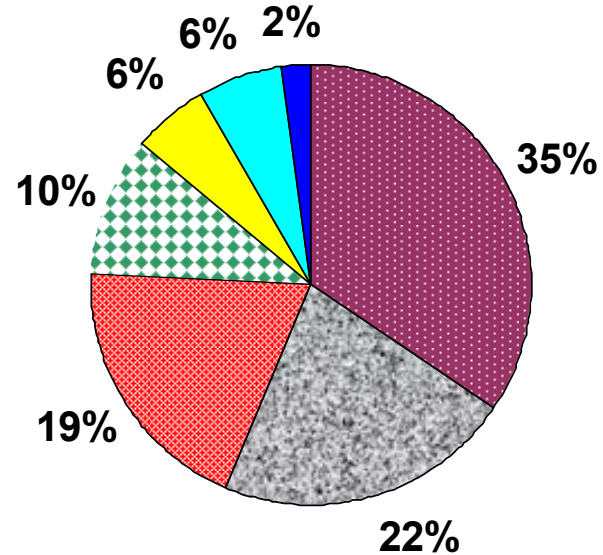
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- Policies are applied against uncertain futures!
- Can be
  - EXPLICIT as in having an “Energy Policy”
- OR
  - IMPLICIT derived from the sum total of previous actions
- Biomass Specific Policy
  - At the Intersection of several policies and jurisdictions
    - Energy
    - Environment
    - Land Use
      - Agriculture
      - Forestry
      - Rural Development
    - Urban
- ZEN Rules
  - not having an Explicit policy can still be an Energy Policy!
  - However well meaning a policy – there is a law of unintended consequences

# World TPES 2000

(Total Primary Energy Supply = 448 EJ)

- Food TPES
  - 2700 Cal/person/day
  - Popn. 6.1 Billion
- Source for Food TPES
  - FAO.org
- Nuclear conversion
  - kWh = 10.8 MJ
- Hydro conversion
  - kWh = 3.6 MJ
- source for fuel TPES (9700 Mtoe)
  - lea.org





# Business as Usual - World Energy according to IEA WEO2002

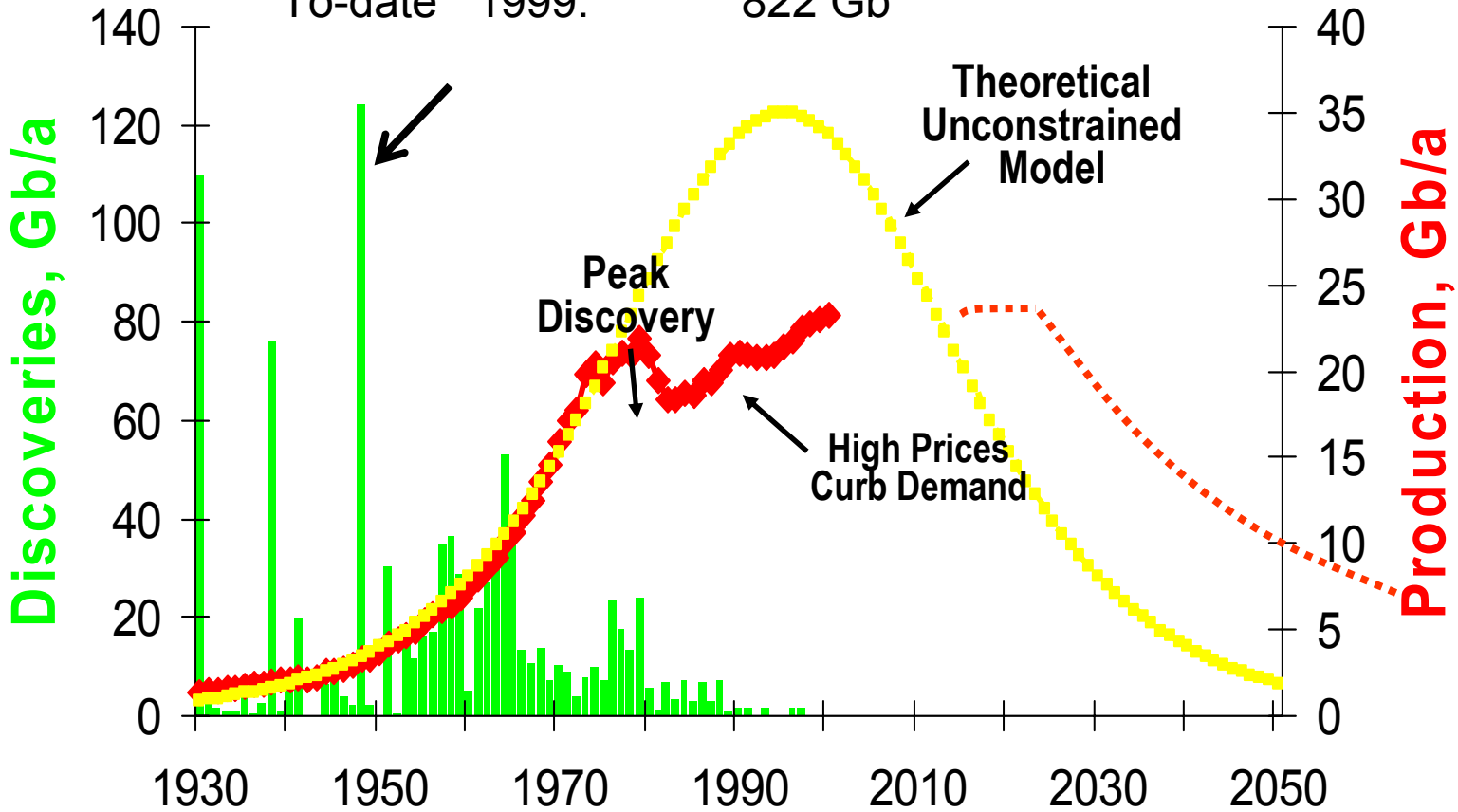
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- 2030 time horizon
- TPES grows at 1.7%/a from 9179 – 15267 Mtoe
  - No shortage of traditional fossil fuel resources (see next slide)
  - Requires considerable investment > 17 T\$ (2002)
    - About 1% of global GDP
    - 50% goes for infrastructure replacement
    - Electricity system needs about 10 T\$ (50% in T&D)
    - Oil and Gas each about 3 T\$
    - Coal < 400 G\$
    - RES < 500 G\$
    - OECD/Developing World about 50:50 in investments
- What if it is not BAU?
  - Energy growth constrained environmentally
    - Global climate change
      - Increased investments for less TPES
        - » Investments in sequestration
        - » Increased renewables investment
    - Policies that follow the Precautionary Principle?
- Kyoto is dead? Watch out for Contraction and Convergence!

Sources: IEA World Energy Outlook 2002,  
IEA World Energy Investment Outlook 2003

# World - conventional oil

Mid-point year: 2005  
 Ultimate 2050: 1800 Gb  
 To-date 1999: 822 Gb



Peak Discovery 1965 Peak Production 2005 Time-lag: 40 years



# Basic Policy Instruments

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- Research and Development
- Demonstration and Deployment
- Dissemination and Policy Promotion
- Government Purchase
- Feed In Laws
- Portfolio Standards (RPS)
- Net Metering
- Revenue generation through fossil fuel taxes
- Grants
  - Consumers
  - Business
  - Renewable energy industry
- Loans
  - Corporate
  - Guarantees
- Tax Incentives
  - Sales tax remission
  - Holidays
  - Personal/Corporate Income





# IEA Country Biomass Policy Portfolios

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- **European Union**

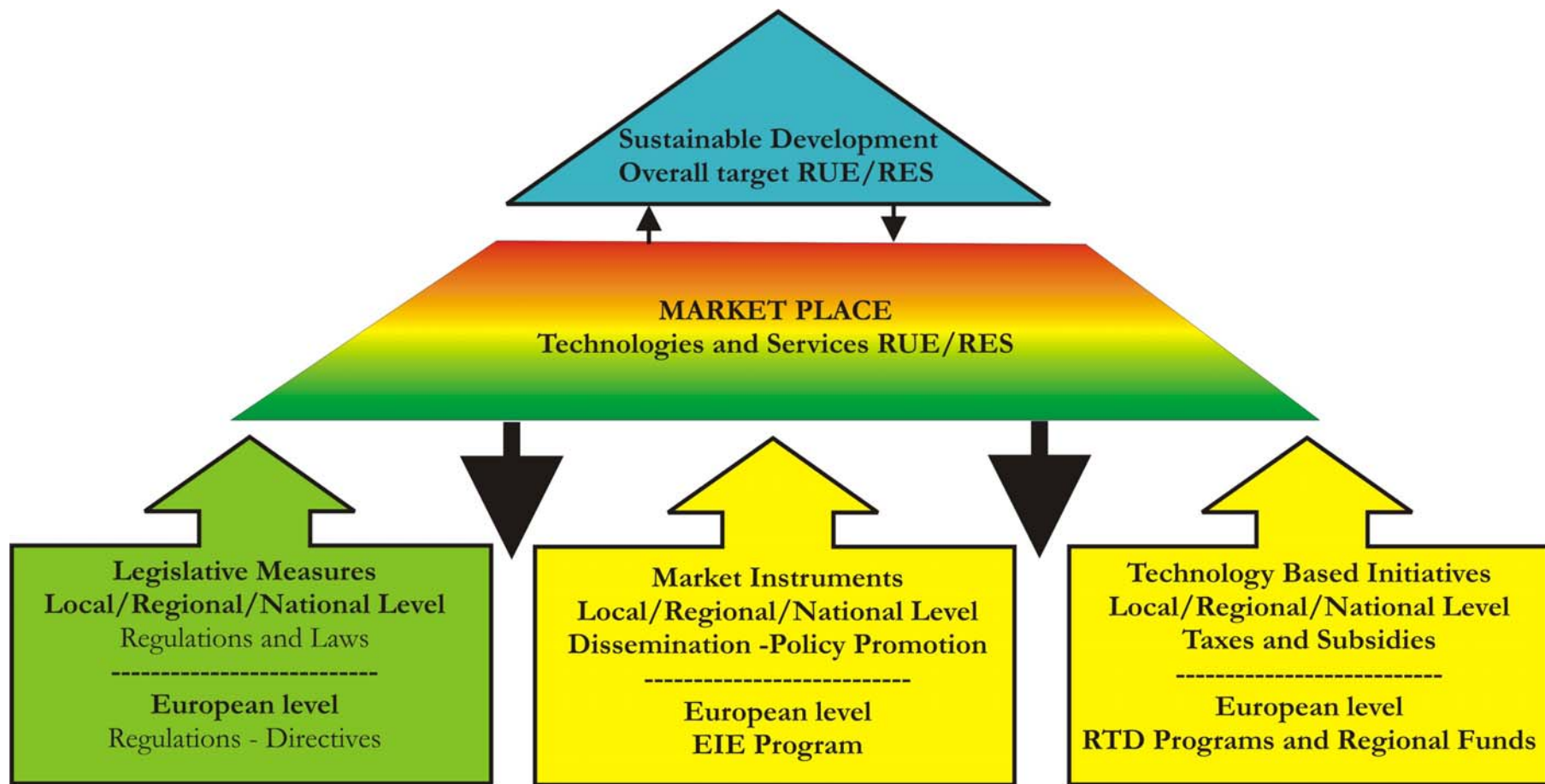
- Directive on the Promotion of Electricity produced from RE sources – **Portfolio Standard**
- Toward a European strategy for the security of energy supply (COM(2000) 769 Final) Green Paper – **Policy Directive**
- Intelligent Energy Europe (EIE, 2003 – 2006), successor to *ALTENER* (RE for electricity and heat), – **Demonstration and Dissemination and Policy Promotion**, also *STEER* (transport) and *SAVE* (EE), *COOPENER* (International development of RE)
- 6<sup>th</sup> Framework RTD (Research, Technology and Demonstration) + Regional Funds - **Research and Development, Demonstration and Deployment**



# EU Policy Linkages

RUE-Rational Use of Energy (EE)

RES -Renewable Energy Services





# IEA Country Biomass Policy Portfolios

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- **United States**
  - **R&D** Biomass R&D Act of 2000
  - RE (renewable energy) Production Credit (REPC) **Corporate Tax Incentive**
  - Renewable Production Tax Credit (PTC) **Feed-In & Tax Incentive**
  - Ethanol – Partial exemption from Excise Tax **Tax Incentive**
  - Farm Bill – Title IX. – **Grants to Business Users**
  - **Historic**
    - PURPA **Feed-In Law**
    - Section 29 Credit **Tax Incentive**
- **Canada**
  - RE Deployment Initiative (REDI) – **Grants to Business Users**
- **Sweden**
  - Energy Taxation on Fossil Fuels for Consumers **Revenue Generation**
  - **Feed-In** Tariff for Biomass
  - **R&D**
  - RE Investment support program – **Grants to Business Users**
- **Finland**
  - Wood Energy Technology Program – **Demonstration Projects**
  - VAT (value added tax) reduction – **Sales Tax Remission**



# IEA Country Biomass Policy Portfolios

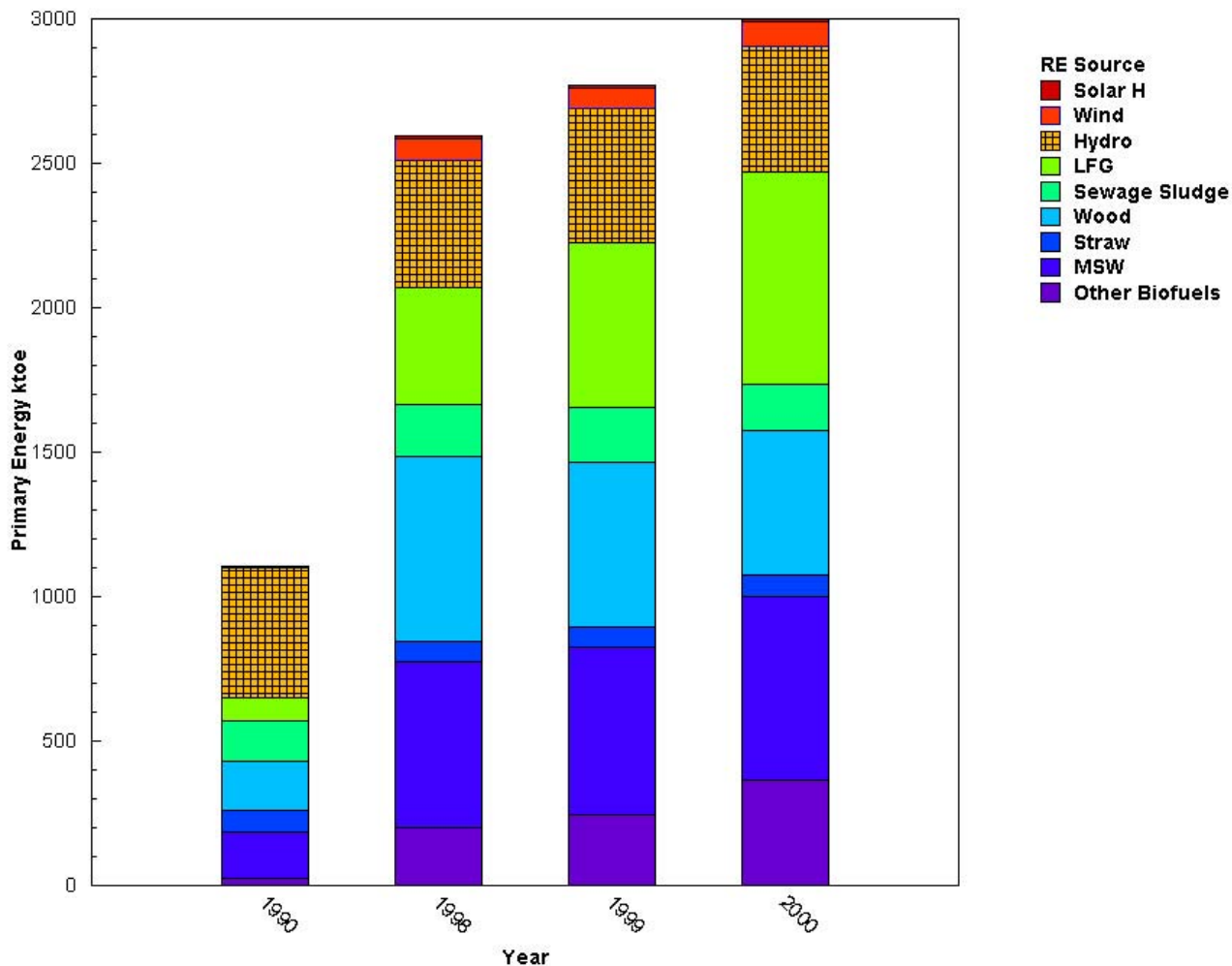
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- **United Kingdom**

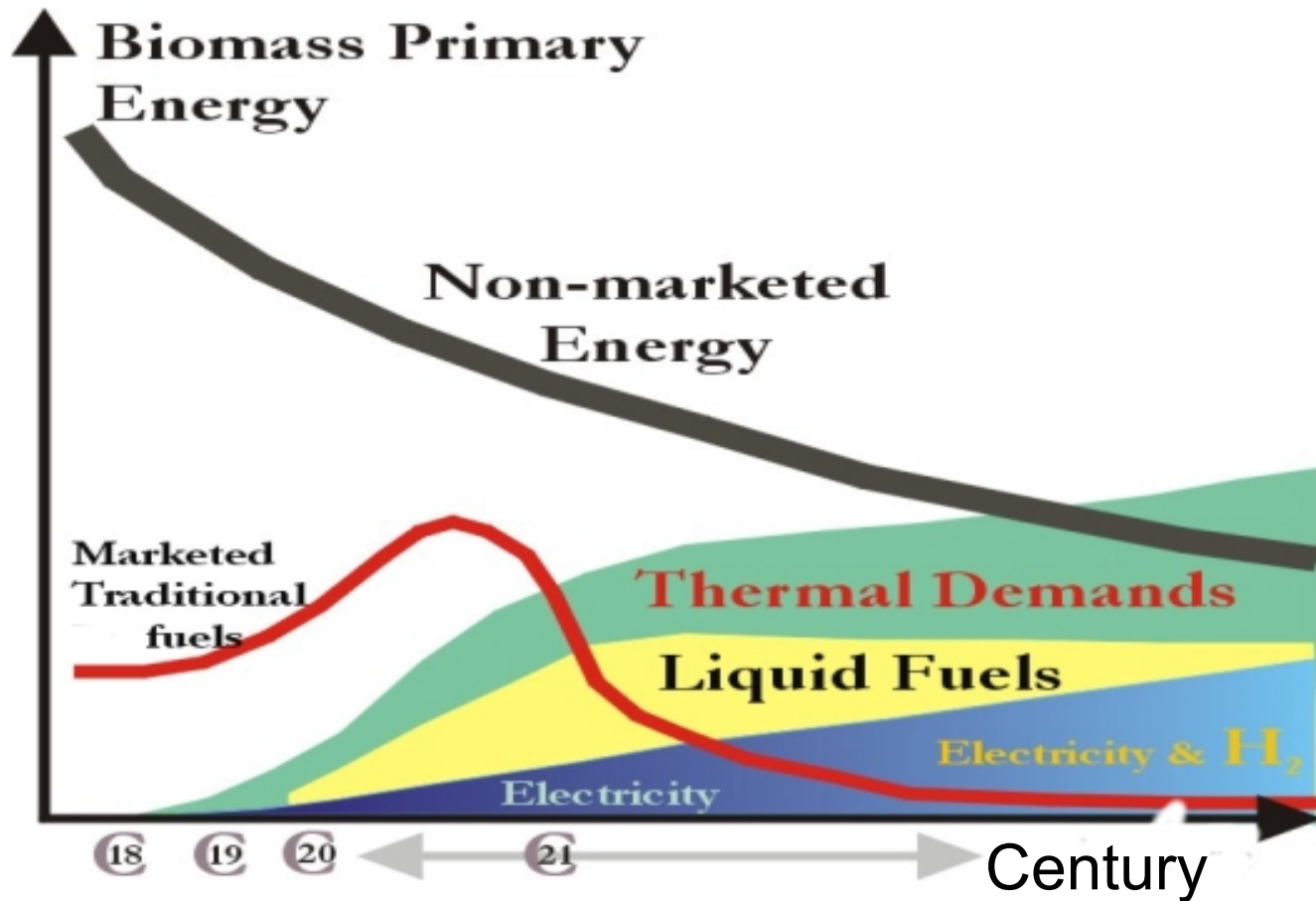
- Pioneer in Liberalization (aka deregulation)
- NFFO (Non-Fossil Fuel Obligation)
  - Fossil fuel levy to generate income
  - Portfolio standard implicit
  - Feed in-law designed for price convergence
  - Effective for biomass – see next slide
  - Reviewed and replaced in 2002
- New and Renewable Energy Program
  - R&D + Demonstration and Dissemination
- Renewables Obligation (UK Utilities Act 2000)
  - Administered by Ofgen (Independent regulator)
  - Portfolio standard started in 2002
    - Compliance through Renewable Obligation Certs
    - Payments from the Climate Change Levy
- **ENERGY WHITE PAPER:** Our energy future creating a low carbon economy
- **60% CO2 reduction by about 2050, with real progress by 2020;**

# Policy in Action

RE Penetration due to NFFO

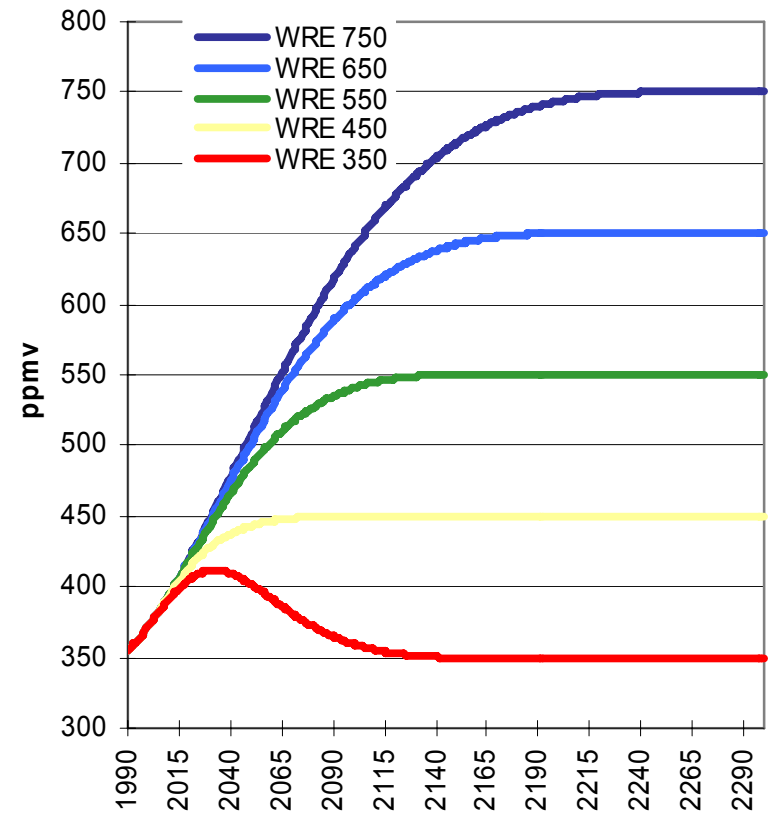
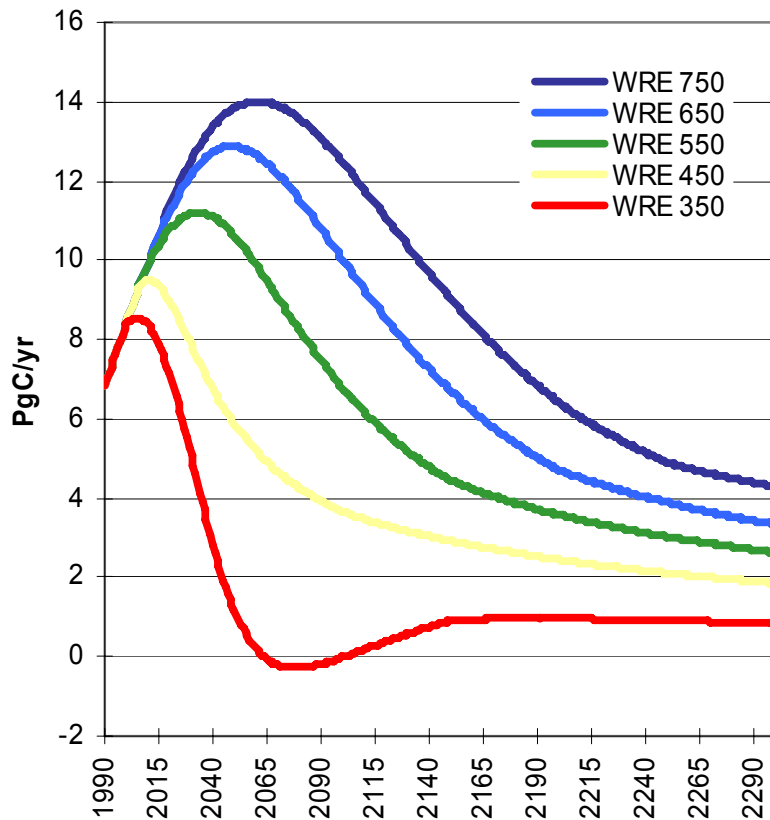


# A vision of the Biomass Future



# The Framework Convention...

*stabilization of greenhouse gas concentrations in the atmosphere*



Global Annual CO2  
Emissions

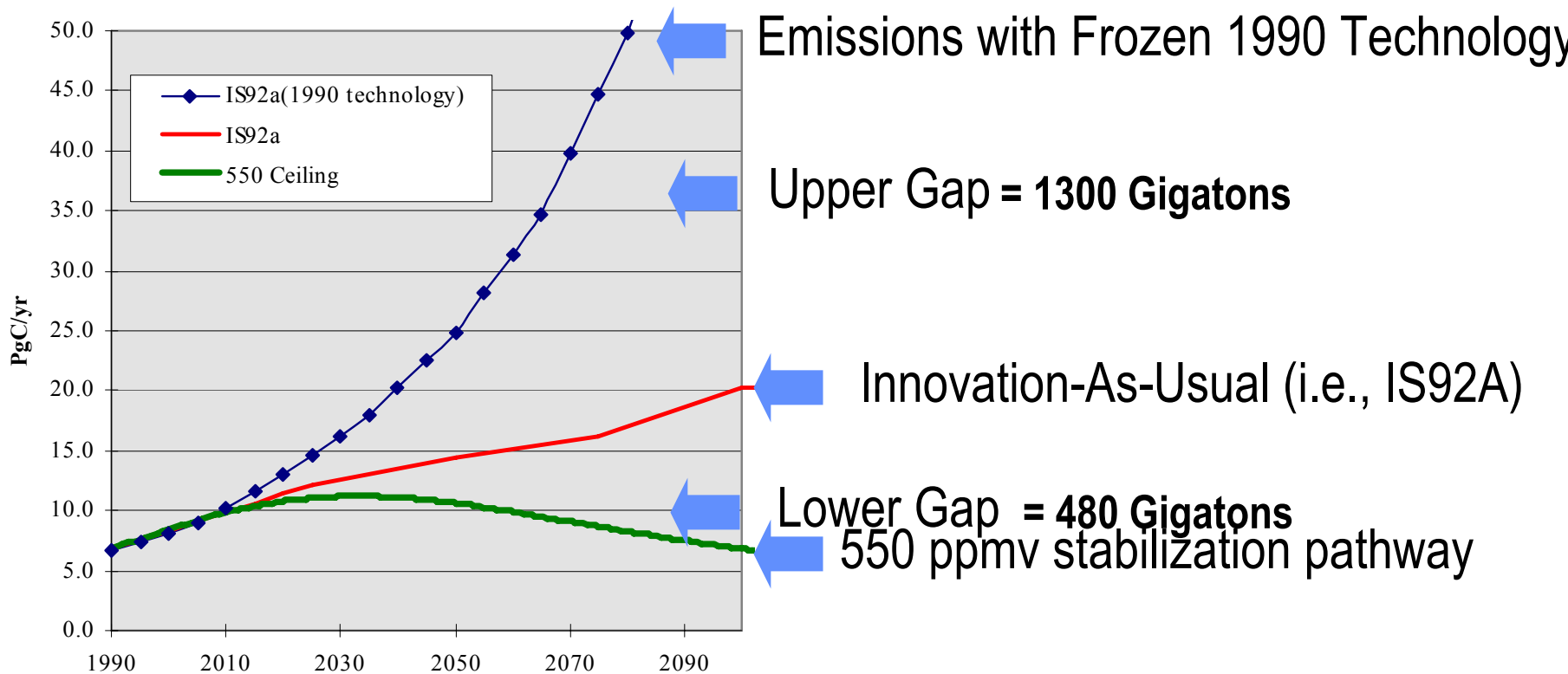


**Concentrations**

JJ Dooley, Staff Scientist

Joint Global Change Research Institute at the Pacific Northwest National Laboratory

# There are Two Critical Innovation Gaps that must be bridged

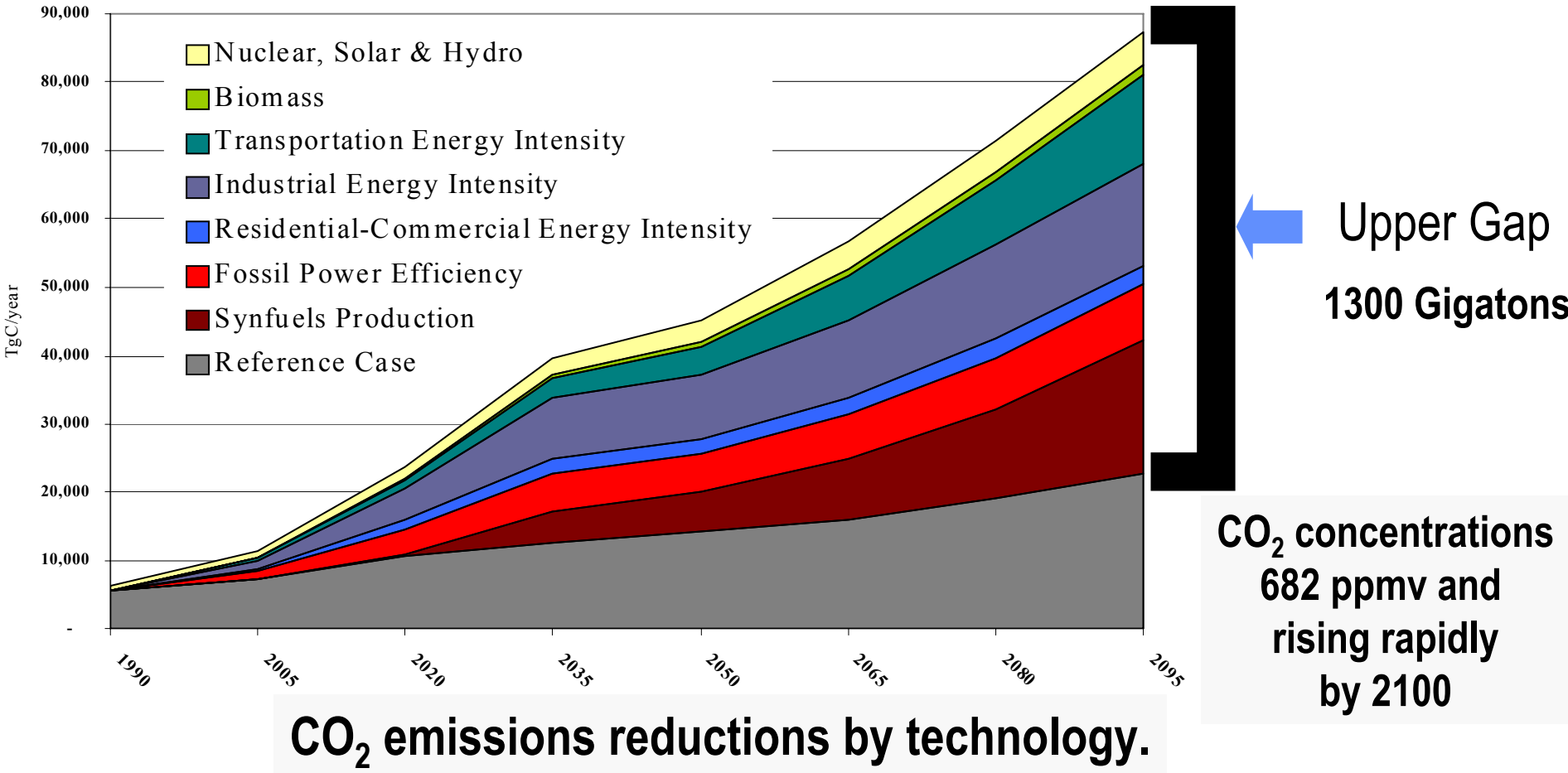


**1300 Gigatons of carbon are simply assumed away before we ever introduce any explicit climate policy.**



# Emissions Reductions “Frozen Tech” to IS92a

## Once Again No Climate Constraint, Just Assumed to Happen

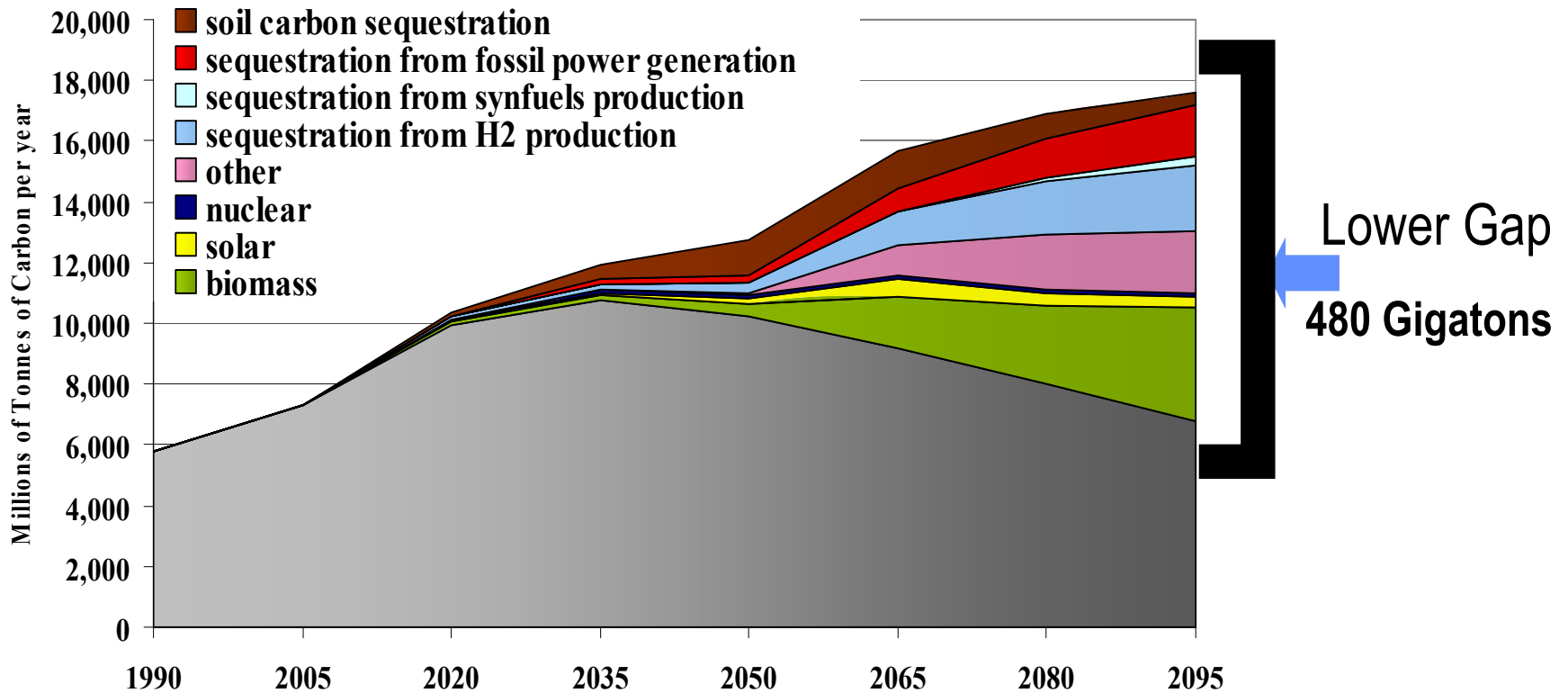


CO<sub>2</sub> emissions reductions by technology.



# If we lived in a CBF 550 world, where would the emissions reductions come from

## Global CBF550 Stabilization "Gap Chart"

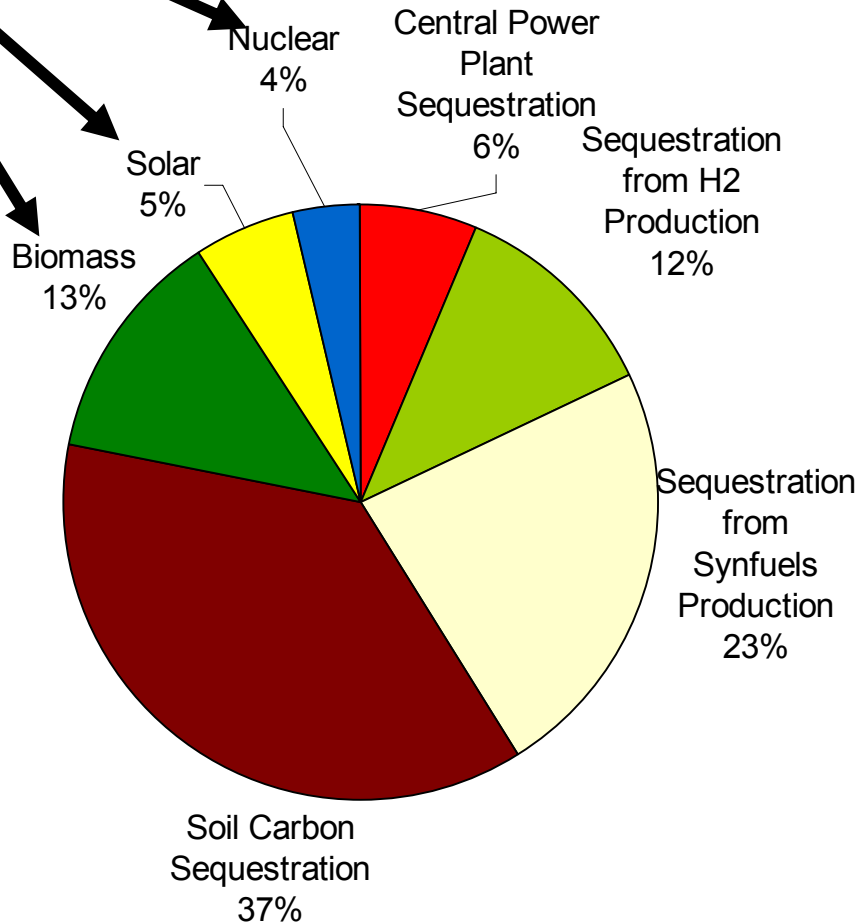


**CO<sub>2</sub> emissions reductions by technology.**



# Composition of Global CO2 Emissions Reductions in 2050 for a CBF 550 World

Deployment Beyond Innovation as Usual



13% of emissions reductions from biomass?

37% of emissions reductions from soil carbon sequestration?

Are we willing to bet the global economy on these agricultural/energy technologies and the cooperation of farmers everywhere?

JJ Dooley, Staff Scientist

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