



# Cogeneration: A Key Part of a Sustainable Energy Future

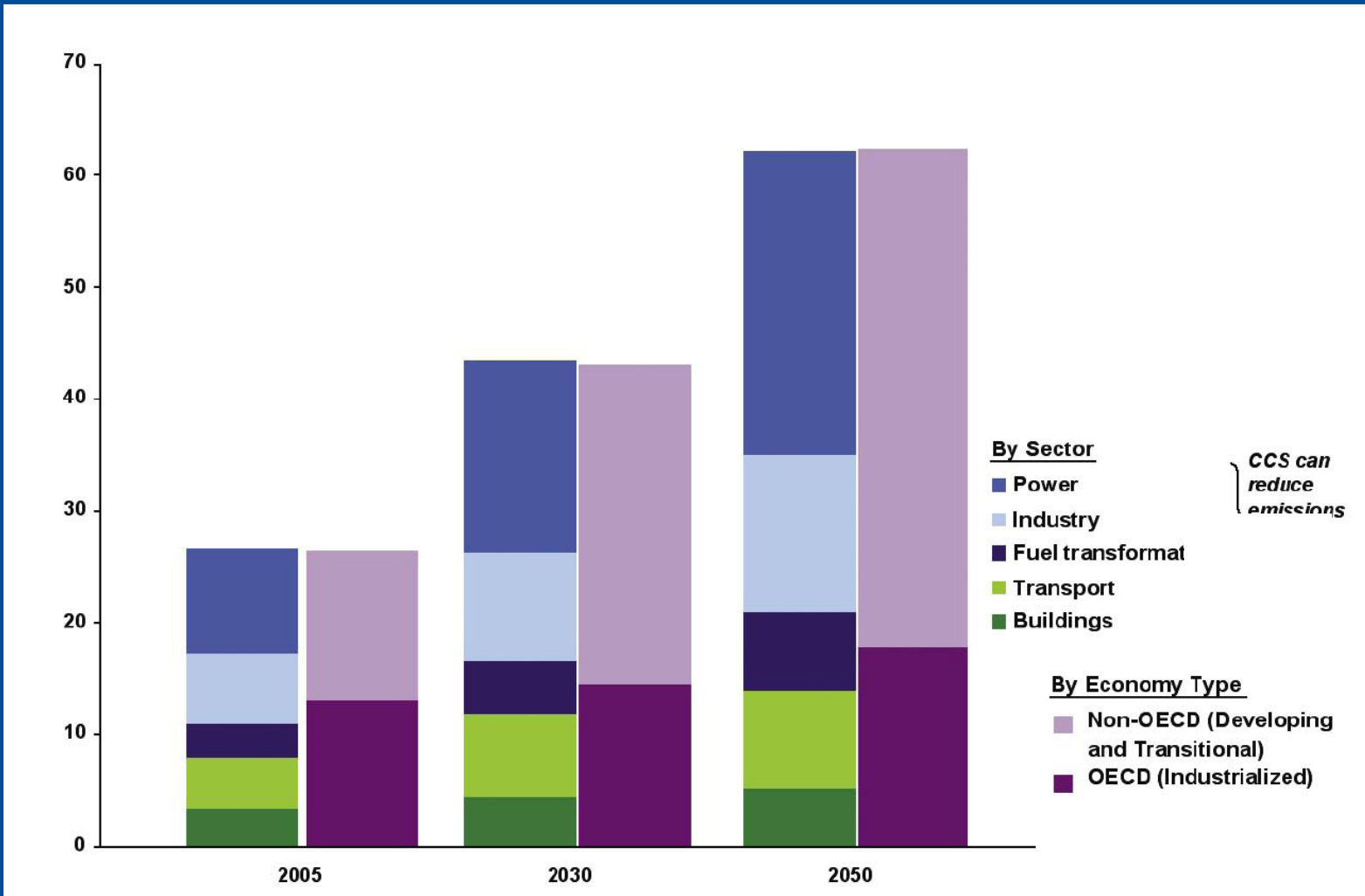
**Tom Kerr**

*9 February 2009  
Sustainable Energy Week, Brussels*

# Overview

- Today's Energy Challenges
- The Role of CHP
- Next Steps for Policy Makers

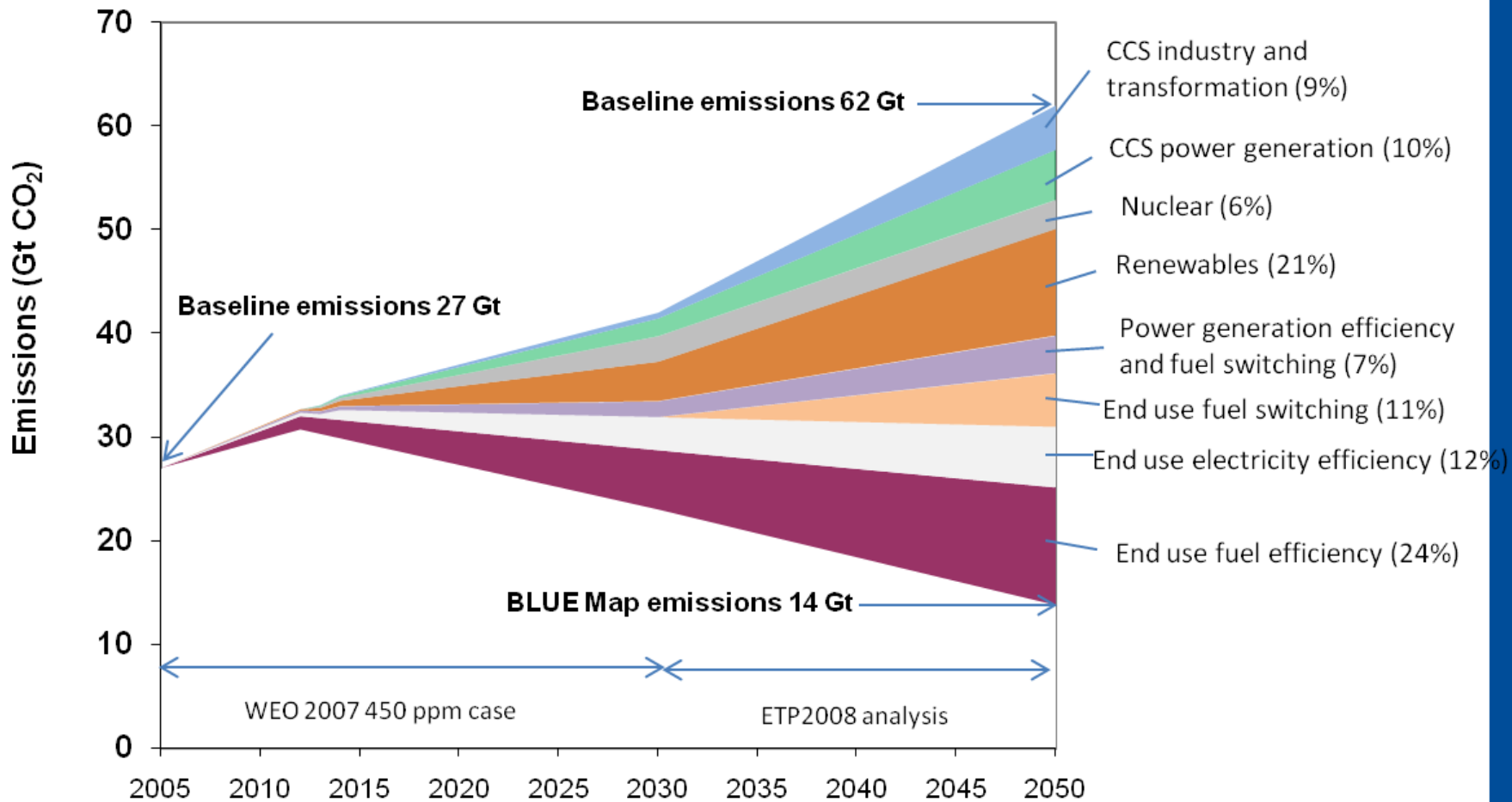
# Trends in Global CO<sub>2</sub> Emissions



Source: data from IEA, *Energy Technology Perspectives* (2008).

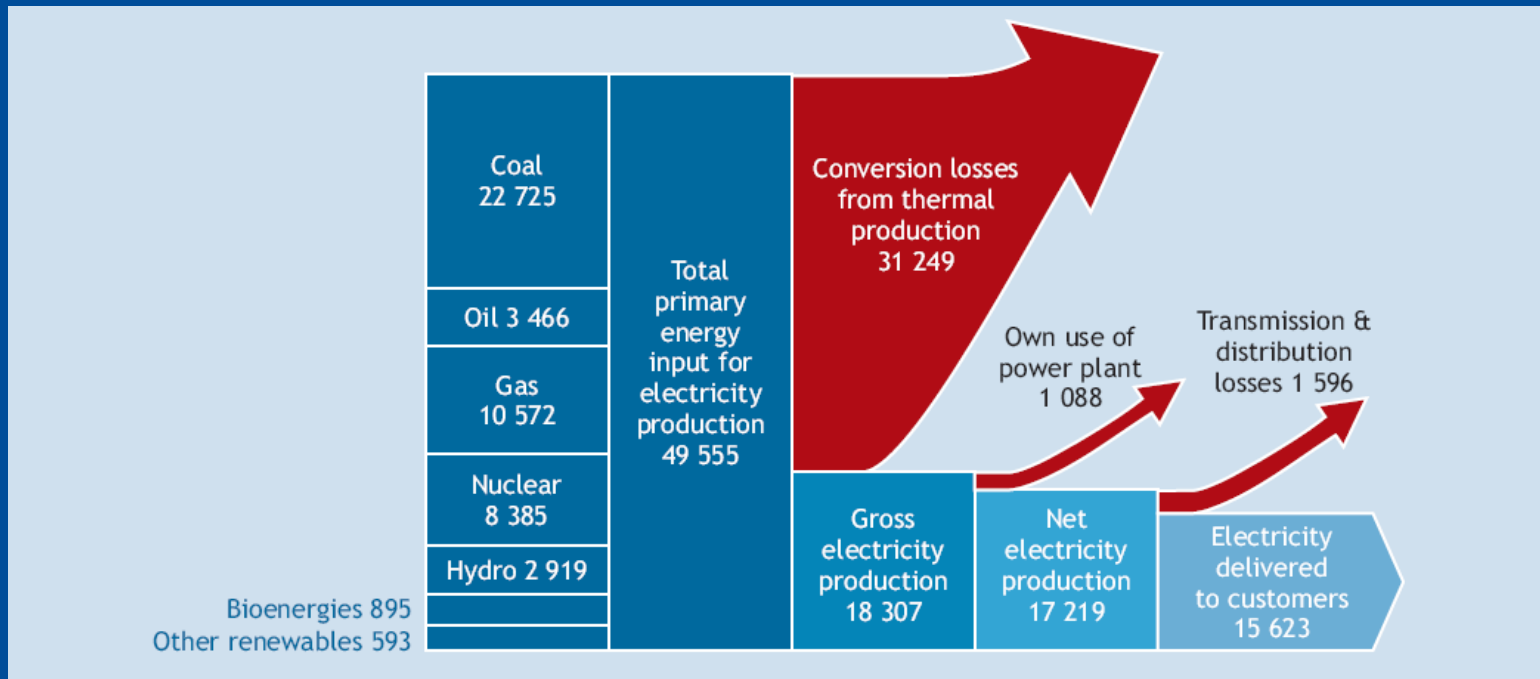
# An Energy Revolution Is Needed

## Cutting Energy-Related CO<sub>2</sub> emissions



# Wasted Energy Is a Huge Opportunity

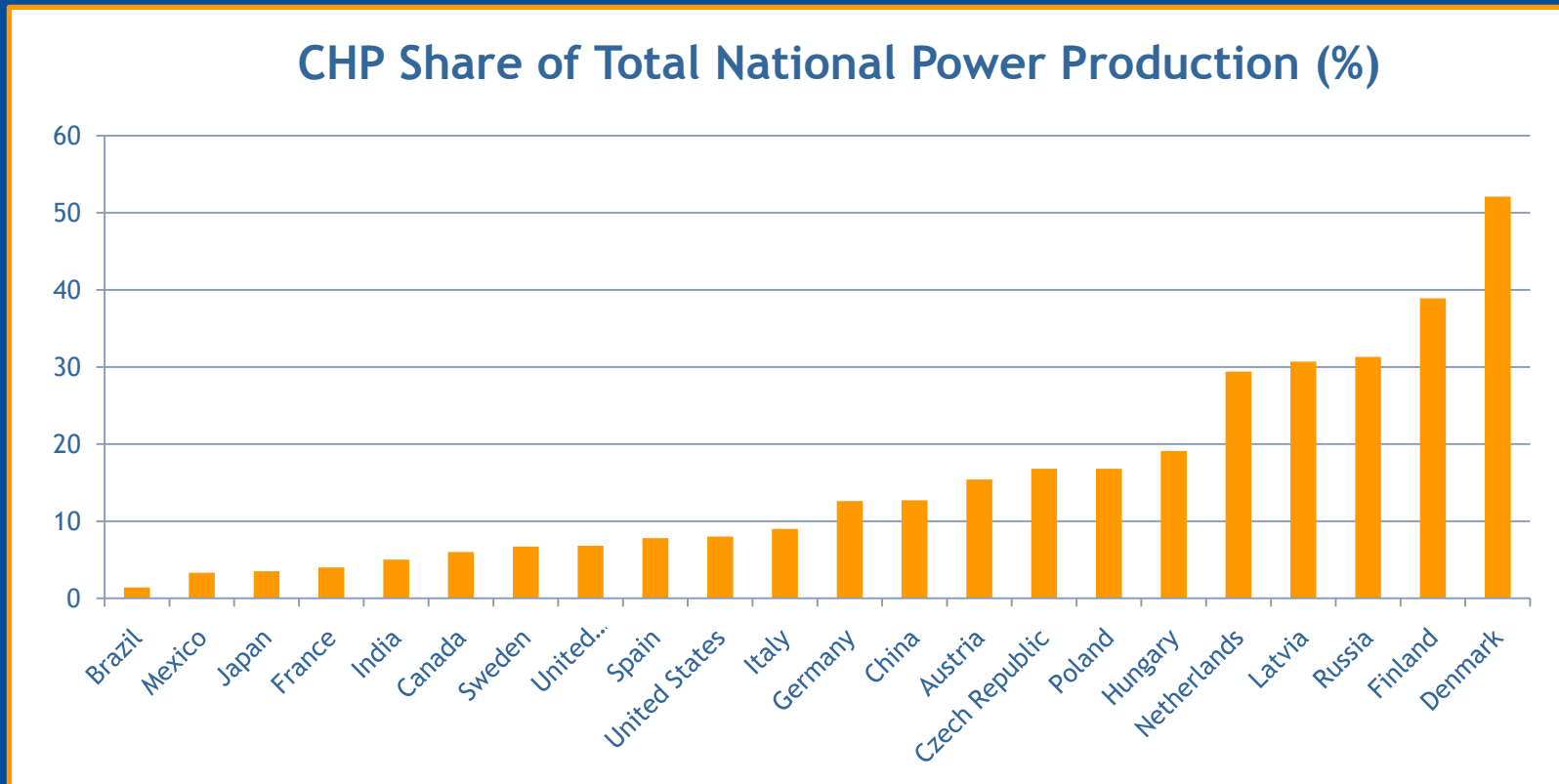
## Energy Flows in the Global Electricity System



Source: IEA, *CHP: Evaluating the Benefits of Greater Global Investment* (2008).

***2/3 of the fuel we use to produce power is wasted --  
CHP can more than double this efficiency***

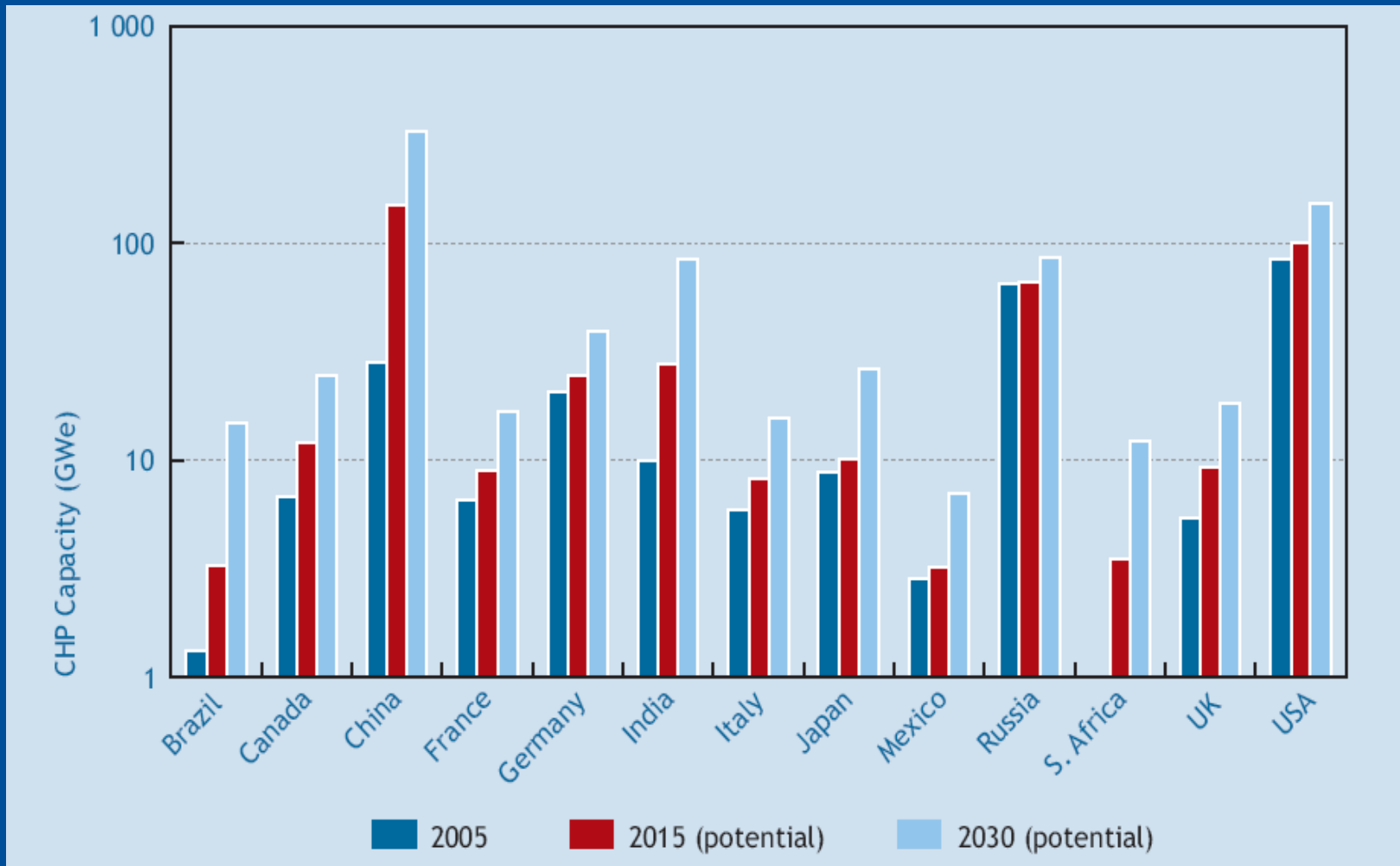
# CHP as a Share of Total National Power Generation



Source: IEA, *CHP: Evaluating the Benefits of Greater Global Investment* (2008).

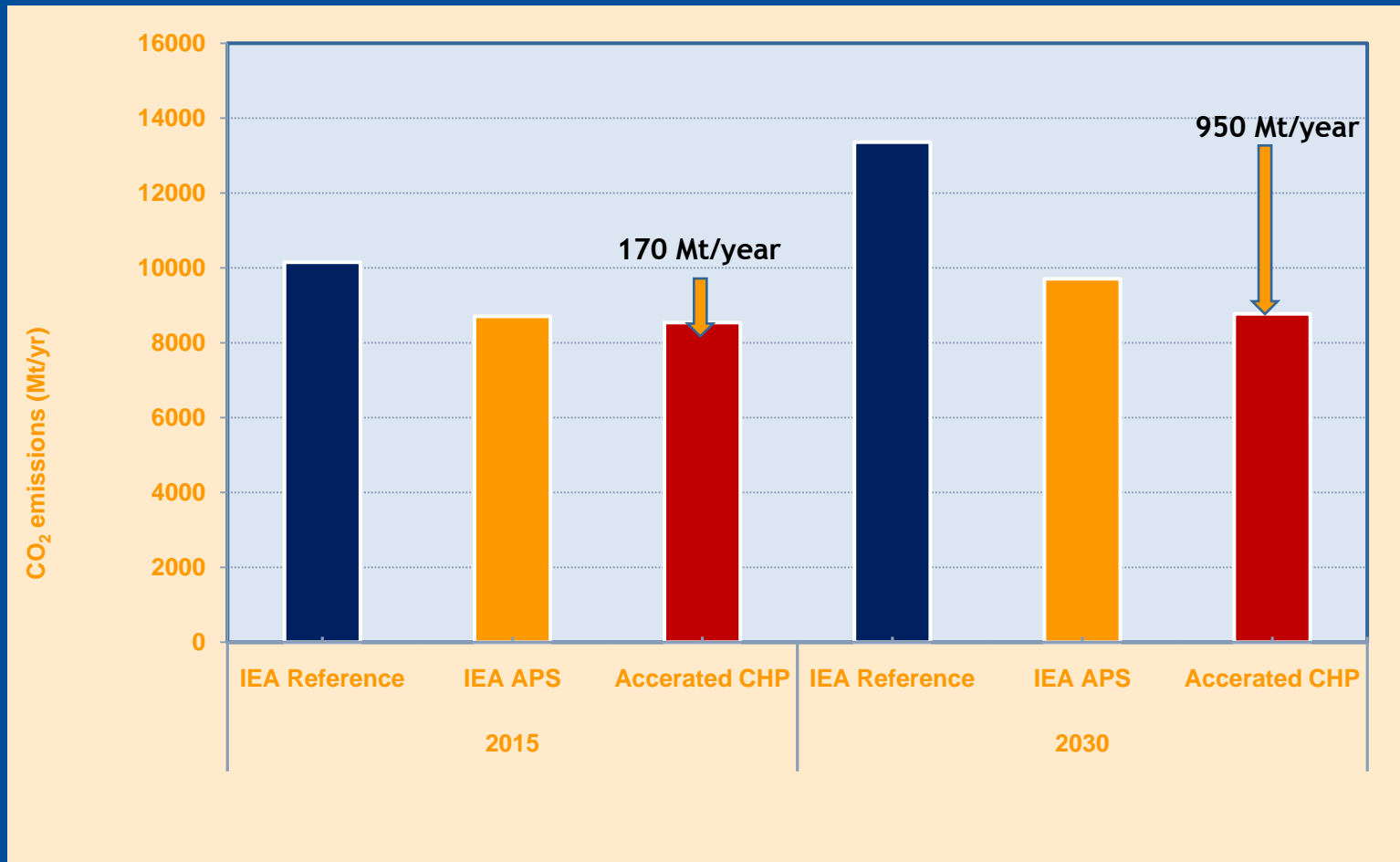
*The global average is just 9%*

# CHP Potentials, 2015 and 2030



Source: IEA, *CHP: Evaluating the Benefits of Greater Global Investment* (2008).

# CO<sub>2</sub> Emissions Benefits



Source: IEA, *CHP: Evaluating the Benefits of Greater Global Investment* (2008).

**2015 reductions = 21% of EU's 2020 target of reducing emissions by 20%**

**2030 reductions = Germany's annual budget in the ETS 2<sup>nd</sup> commitment period**

## ...So Why Are We at 9%?

- Difficulties connecting CHP to the electricity grid
- Lack of information about cost savings, other benefits
- CHP benefits difficult to recognize in GHG regulation

*Government champions needed*

# Key CHP Policies

| Policy Type                                   | Policy Makers |             |           |                   |                  |
|---|---------------|-------------|-----------|-------------------|------------------|
|   | Energy        | Environment | Financial | Local authorities | Network planners |
| <i>Financial and Fiscal Support</i>           | X             | X           | X         | X                 |                  |
| <i>Utility Supply Obligations</i>             | X             |             | X         |                   | X                |
| <i>Local Infrastructure and Heat Planning</i> | X             |             | X         | X                 |                  |
| <i>Emissions trading</i>                      | X             | X           | X         | X                 |                  |
| <i>Interconnection Measures</i>               | X             |             |           |                   | X                |
| <i>Capacity Building/Education</i>            | X             | X           | X         | X                 |                  |

# The EU is a Leader in CHP... but Much More Can Be Done

Denmark Rating:



Germany Rating:



Finland's Rating:



Netherlands Rating:

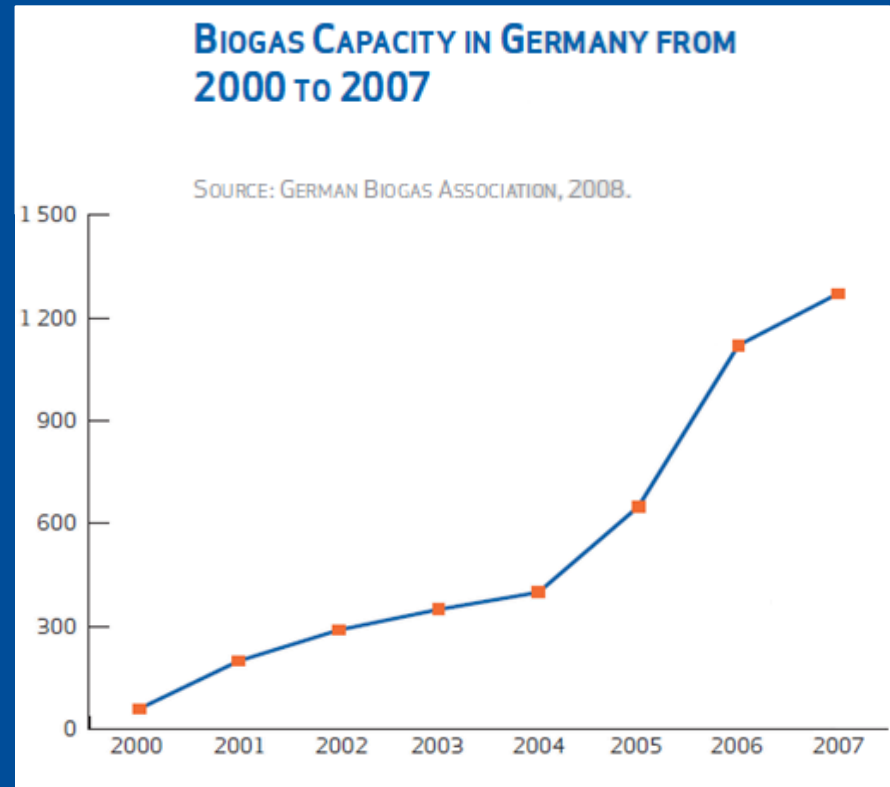


UK Rating:



# German CHP Promotion Policies

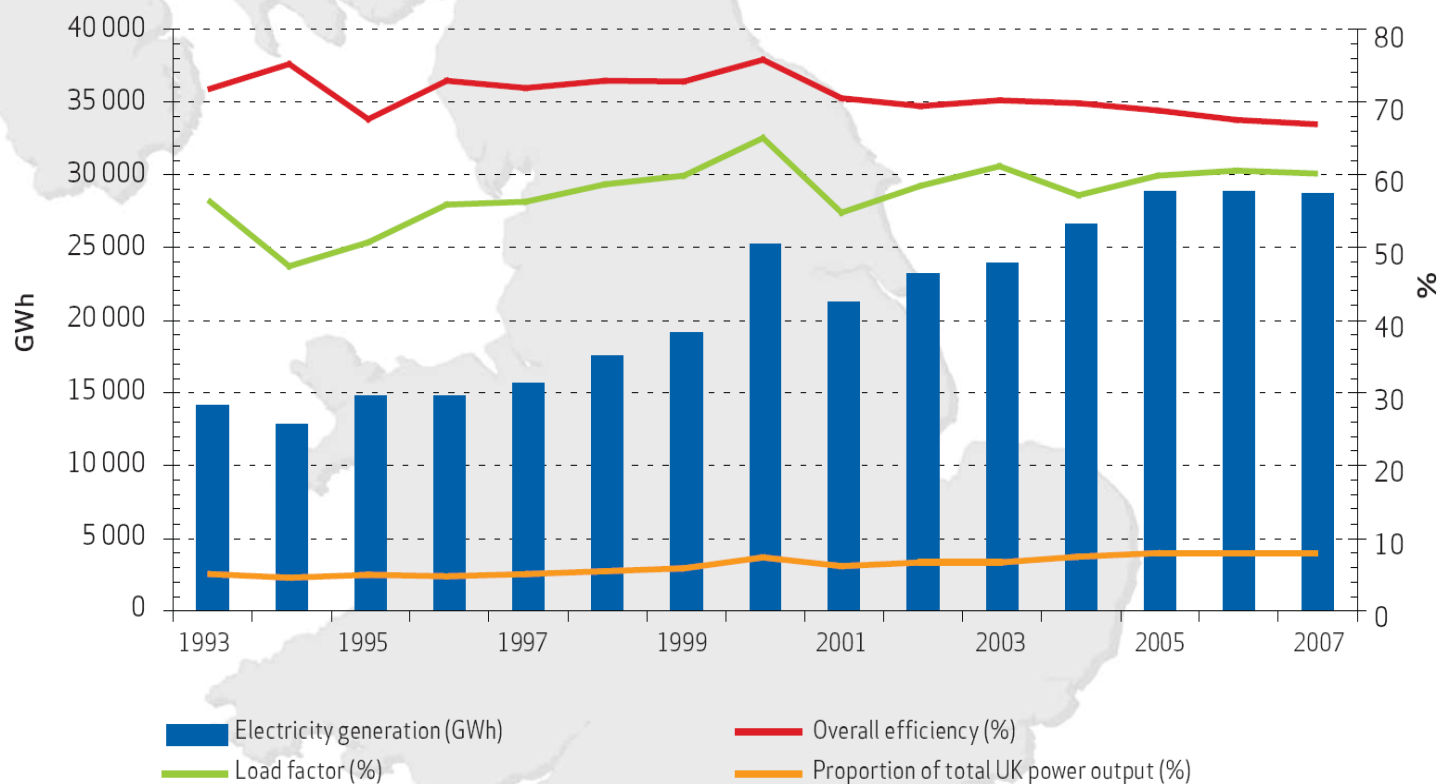
- The 2002 CHP Law has helped drive CHP plants through bonus payments
- A new CHP law, which aims to double CHP electricity generation by 2020, is expected to bring further benefits for all CHP ranges in 2009
- Other policy support includes
  - Use of benchmarks under EU ETS
  - CHP/DHC-friendly building codes
  - Feed-in tariffs for biogas CHP
  - 500€ for fuel cells and CHP



# CHP in the UK

**FIGURE 4:  
CHP MARKET  
PERFORMANCE 1993  
TO 2003**

SOURCE: DEPARTMENT FOR BUSINESS,  
ENTERPRISE AND REGULATORY REFORM  
(BERR), *DIGEST OF UK ENERGY  
STATISTICS 2008 (DUKES 08) LONG  
TERM TRENDS*, JULY 2008



Source: IEA, *CHP/DHC Country Profile: United Kingdom* (2008).

*Despite a number of policies, CHP growth has been flat*

# Finland: CHP Leadership Through Limited Government Involvement

- Key factors to Finland's success
  - Taxes on end use of energy
  - Taxes based on carbon content of fuel
    - ◆ Have led to greater use of biomass CHP
  - Easy to build smaller-scale CHP/DH units under the Electricity Market Act
- CHP/DH encouraged and promoted by local governments

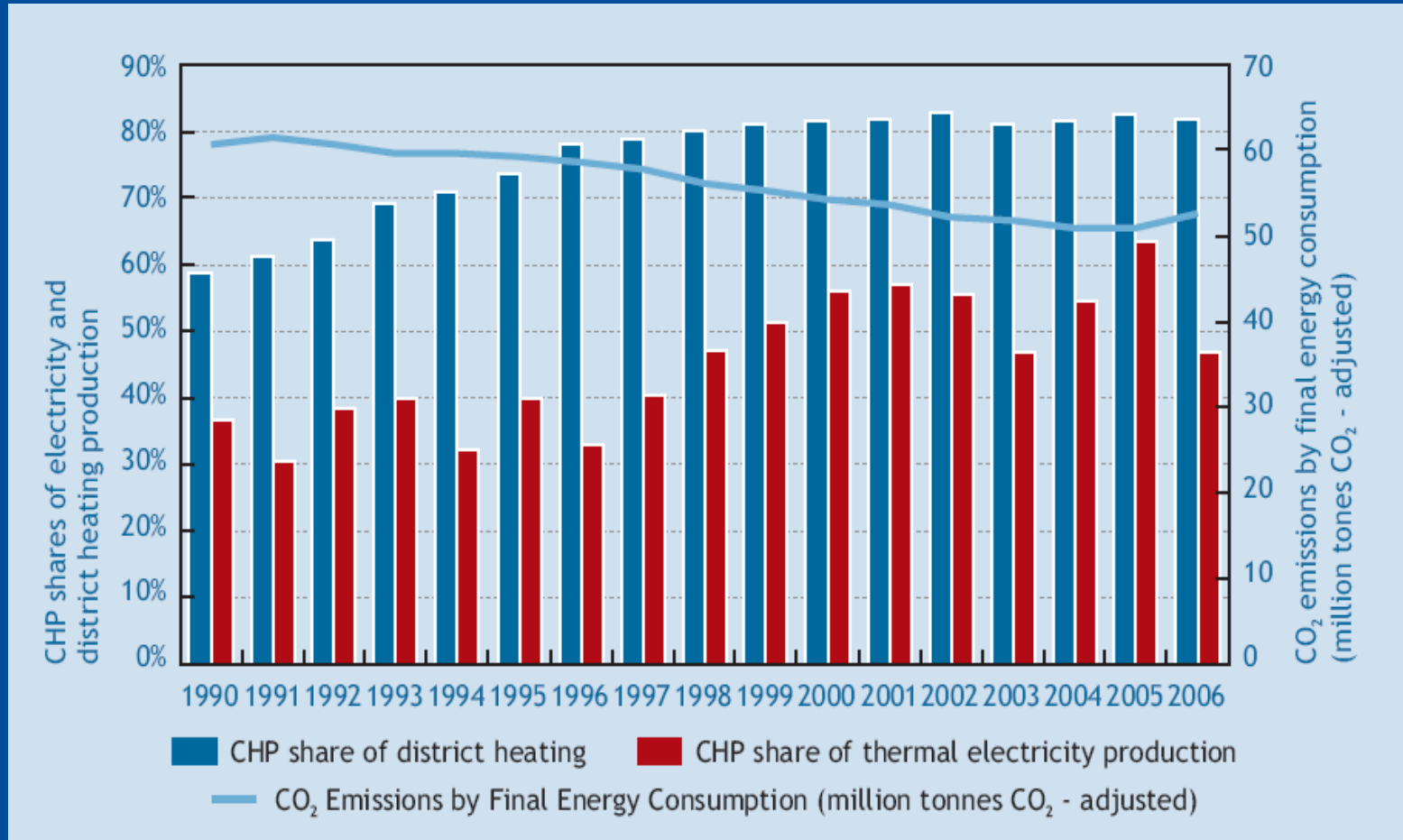
# CHP in the ETS: Lessons Learned

- CHP causes onsite emissions to increase, overall global emissions to decrease
- Unless ETS design reflects this issue, CHP will normally be penalised
- Other issues
  - Determining the sector for CHP
  - Defining the boundaries for inclusion of CHP/DHC
- CHP should be addressed through specific allocation design features
  - Double benchmarking
  - CHP 'bonus allowances'
  - Reducing the compliance factor
- Examples include Germany, Italy, Austria, Belgium, France, Greece and Spain

# Dutch CHP Agency (Projektbureau Warmte-Kracht)

- Dutch CHP boom in the 1980s/90s supported by the creation of a Dutch CHP Agency
- Brought together government, industry and energy companies
- Collaboration to identify opportunities, advise on policy and implement new projects.
- The Agency given the mandate to overcome the regulatory and other barriers to CHP development

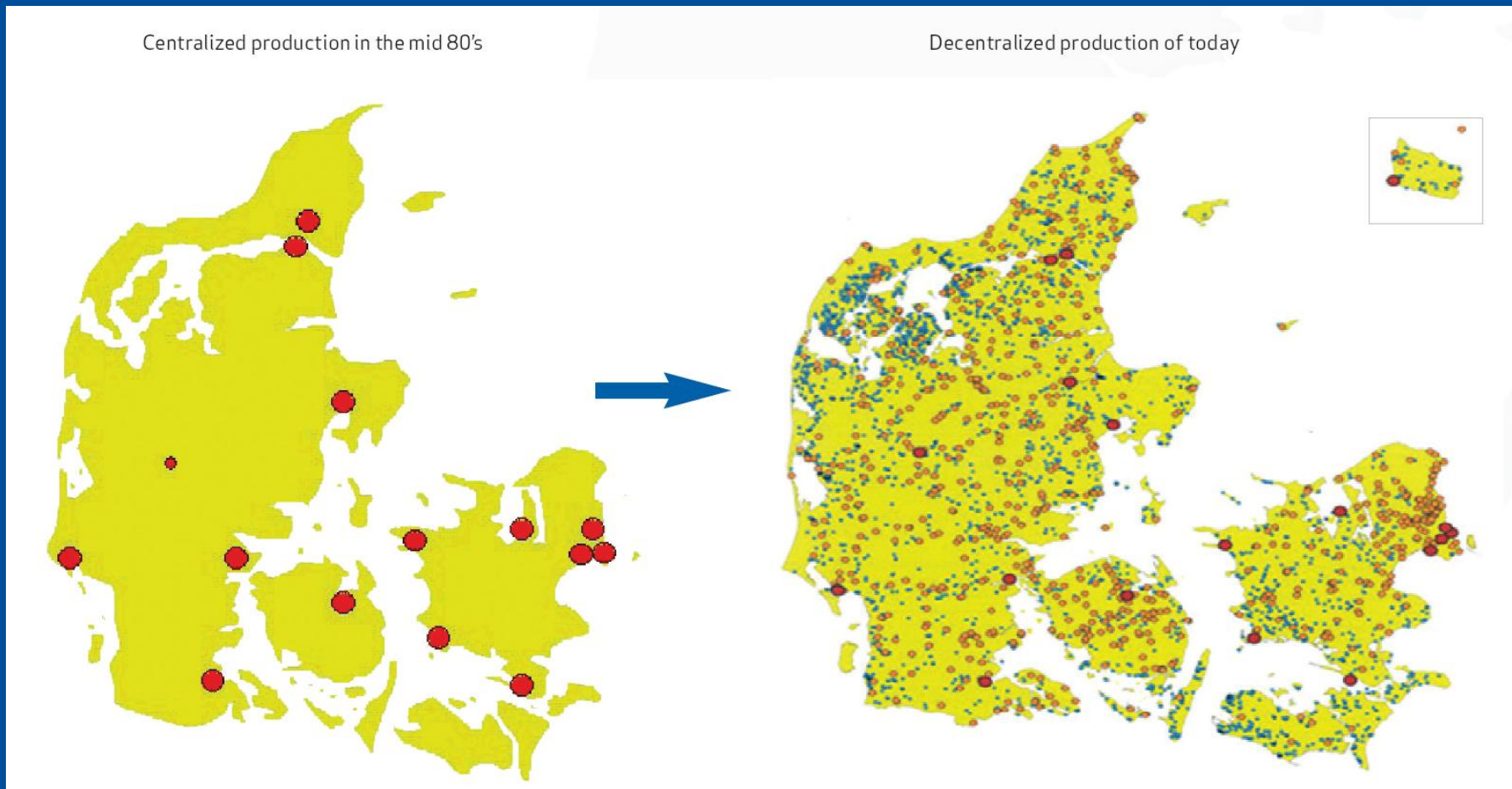
# The Denmark Story: I



Source: IEA, *CHP: Evaluating the Benefits of Greater Global Investment* (2008).

***A strong government role in planning heat supply and demand***

# The Denmark Story: II



Source, IEA, *CHP/DHC Scorecard: Denmark* (2008).

*Denmark's cities said "Yes, in my backyard!"*

# Leveraging EU CHP Leadership: The IEA's Recommendations

- Establish a locational signal for CHP investment
- Expand local energy planning resources
- Create a national CHP target and strategy beyond 2010
- Recognize efficient CHP in environmental policies: ETS, Ecotaxes, climate change levies
- Continue support for renewable CHP/DHC, particularly in planning urban development
- Expand export opportunities for CHP/DHC - India, China

# The International CHP/DHC Collaborative



Advancing Near-Term Low Carbon Technologies

## For More Information

Visit the IEA website at  
[www.iea.org/G8/CHP/chp.asp](http://www.iea.org/G8/CHP/chp.asp)

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*Thank you*