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ENERGIJE**

The Cost of the Kyoto Protocol: Moving Forward on Climate Change Policy While Preserving Economic Growth

Dr. Margo Thorning

Managing Director,
International Council for Capital
Formation

Brussels Office:

Park Leopold, Rue Wiertz
50/28 B-1050

Brussels, Belgium

Tel: +32.2.401.68.44

Fax: +32.2.401.68.68

Email: mthorning@iccfglobal.org

Web: www.iccfglobal.org

Washington D.C. Office:

1750 K Street, Suite 400

Washington, D.C. 20006

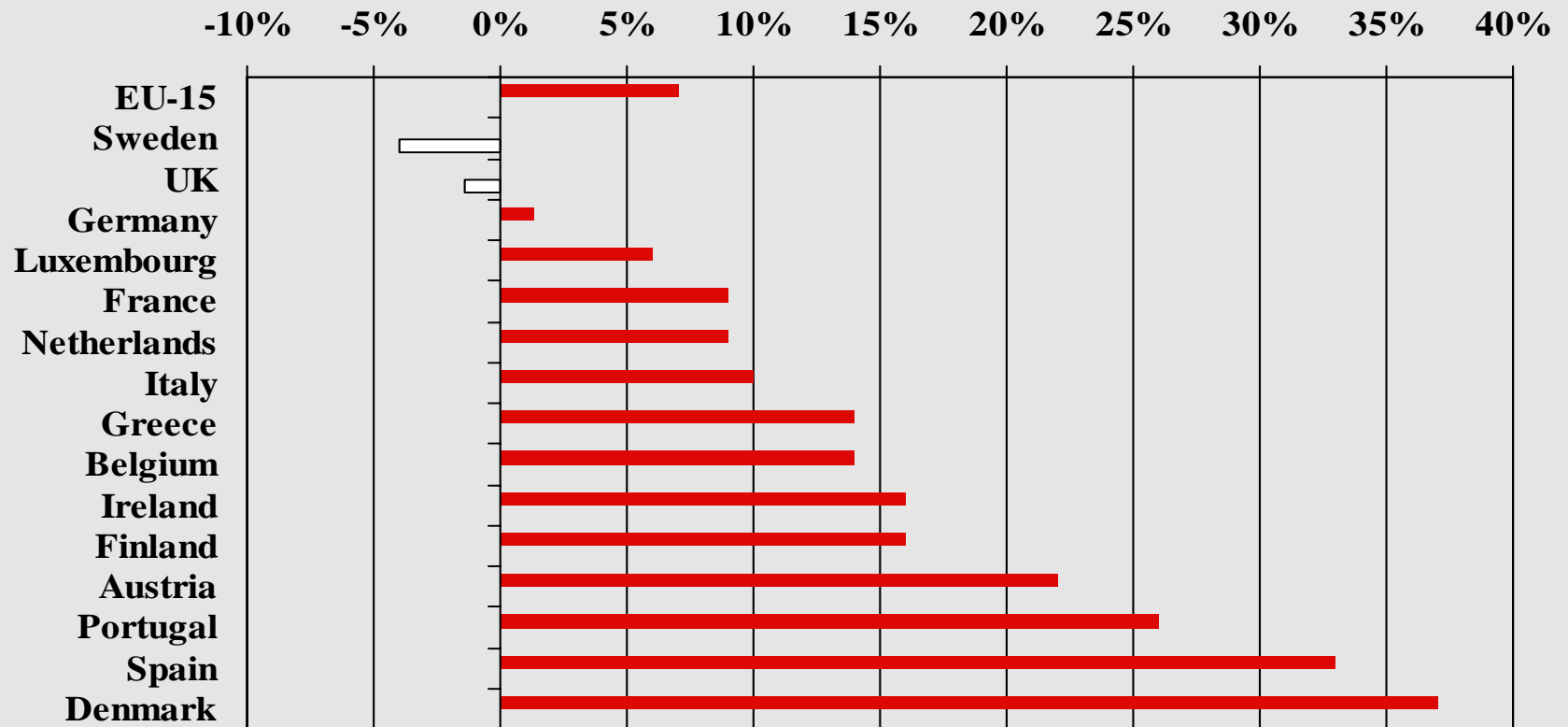
Tel: 202-293-5811

Fax: 202-785-8165



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Greenhouse Gas Emissions in the European Union Projected to Exceed Kyoto Targets in 2010



Source: European Environmental Agency, November 30, 2004



Macro Model Simulations of Meeting Kyoto Protocol and Additional Targets for Italy, Spain, UK and Germany

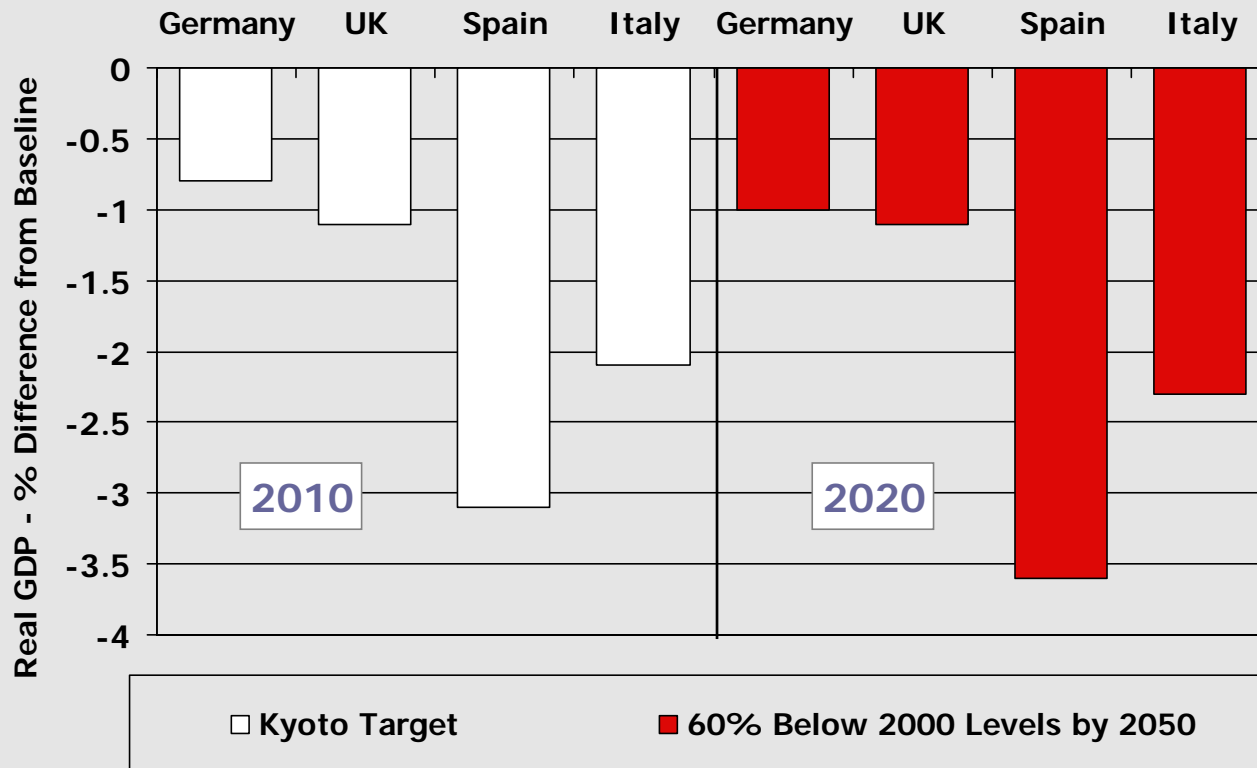
- ❑ Macro Models: The advantage of a macro model is that it measures the overall costs to an economy of meeting emission targets where the short-term frictional costs of adjustment are included.

- ❑ Assumptions of macroeconomic analyses by Global Insight for EU countries:
 - ❖ An international emission trading system is established
 - ❖ Companies can purchase emission credits at:
 - ❖ €39 in 2010 per metric tonne of Carbon Dioxide
 - ❖ €50 in 2020 per metric tonne of Carbon Dioxide
 - ❖ €55 in 2025 per metric tonne of Carbon Dioxide
 - ❖ Crude oil prices (in constant euros) begin to decline slowly in 2006 and fall to 2000 levels by 2025
 - ❖ All non-CO₂ emission reductions are met but the costs are not included in analysis.



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Impact of Kyoto Protocol and Additional Targets on GDP in the EU in 2010 and 2020: Macroeconomic Model Results



Source: Global Insight, Inc. 2005



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Impact of Kyoto Protocol and Additional Targets on Energy Prices for Industry

Macro Model Results

(percent increase compared to baseline)

	Electricity		Natural Gas	
	2010	2020	2010	2020
Italy	13%	14%	44%	54%
UK	35%	34%	46%	57%
Spain	23%	27%	42%	51%
Germany	31%	32%	30%	39%

Targets:

2010: Kyoto Target

2020: 60% below 2000

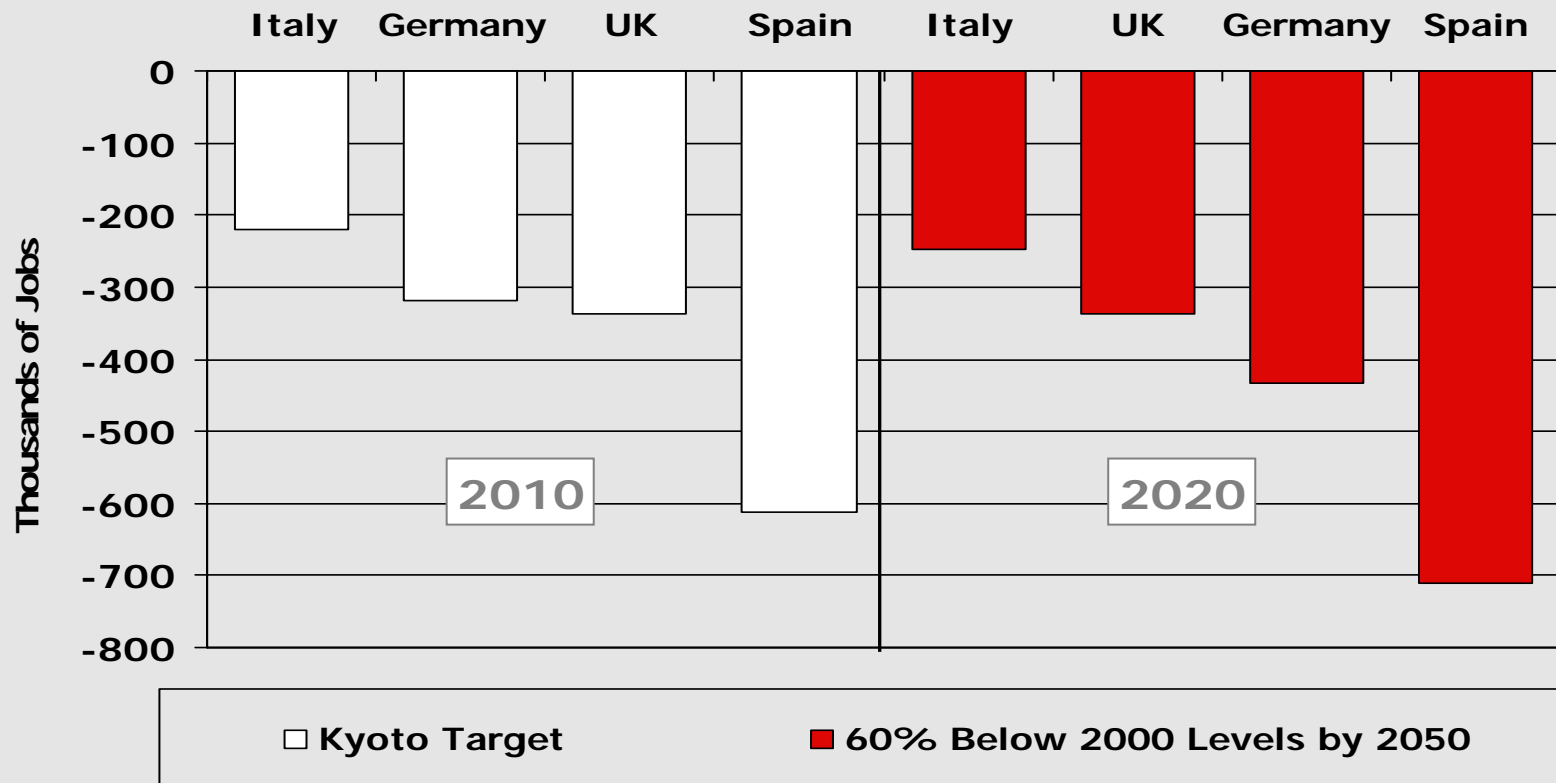
levels by 2050



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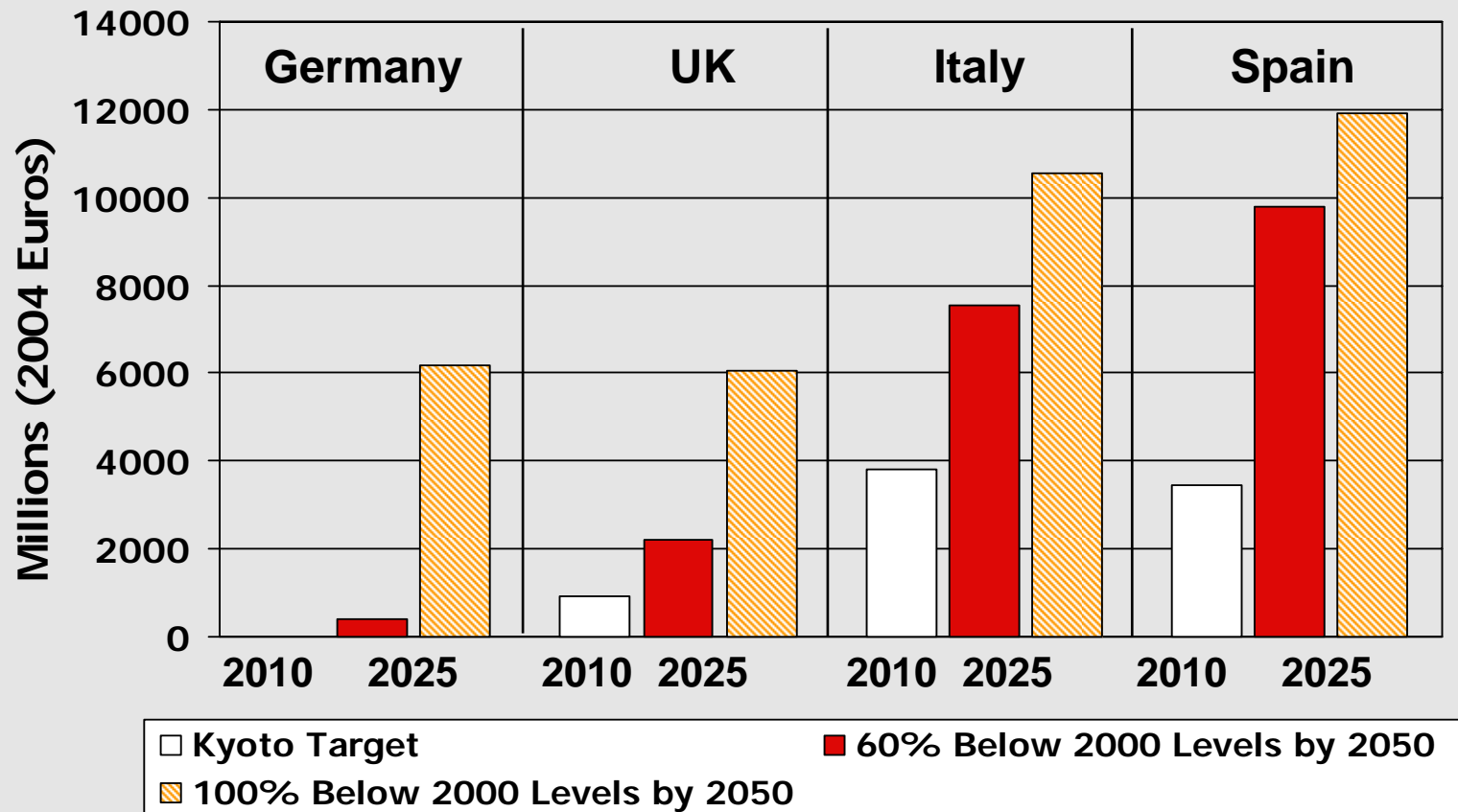
Impact of Kyoto Protocol and Additional Targets on Employment in the EU in 2010 and 2020:

Macroeconomic Model Results





Wealth Transfer If Countries Purchase International CO2 Credits





Impact of the Kyoto Protocol and Additional Tighter Targets on Germany (With and Without Nuclear Power)

Macroeconomic Model Results Compared to Baseline Forecast

	With Nuclear		Without Nuclear	
	Kyoto Target	60% Reduction Target	Kyoto Target	60% Reduction Target
	2010	2025	2010	2025
GDP (percent change)	-0.8	-1.4	-0.9	-1.6
Employment	-318,000	-519,000	-342,000	-627,000
Wealth Transfer	0	€ 398 million	€ 351 million	€ 5.1 billion



Caps on Carbon Emissions Do Not Provide Incentives for Radical New Energy Technologies

- Tight carbon caps will not force the R&D needed to develop the radical new technologies needed to dramatically reduce carbon emissions according to U.S. DOE/EIA reports.
- Private investors will not be willing to spend large amounts to new technologies unless they think carbon prices will stay high enough to enable them to cover both fixed costs (R&D) as well as operating costs.
- Future governments are not likely to keep carbon prices high (through taxes) once the new technologies are developed because low carbon taxes are better for economic growth.
- Anticipating that governments will not keep carbon prices high, investors may be unwilling to commit a large amount of funds to radical new energy technologies.



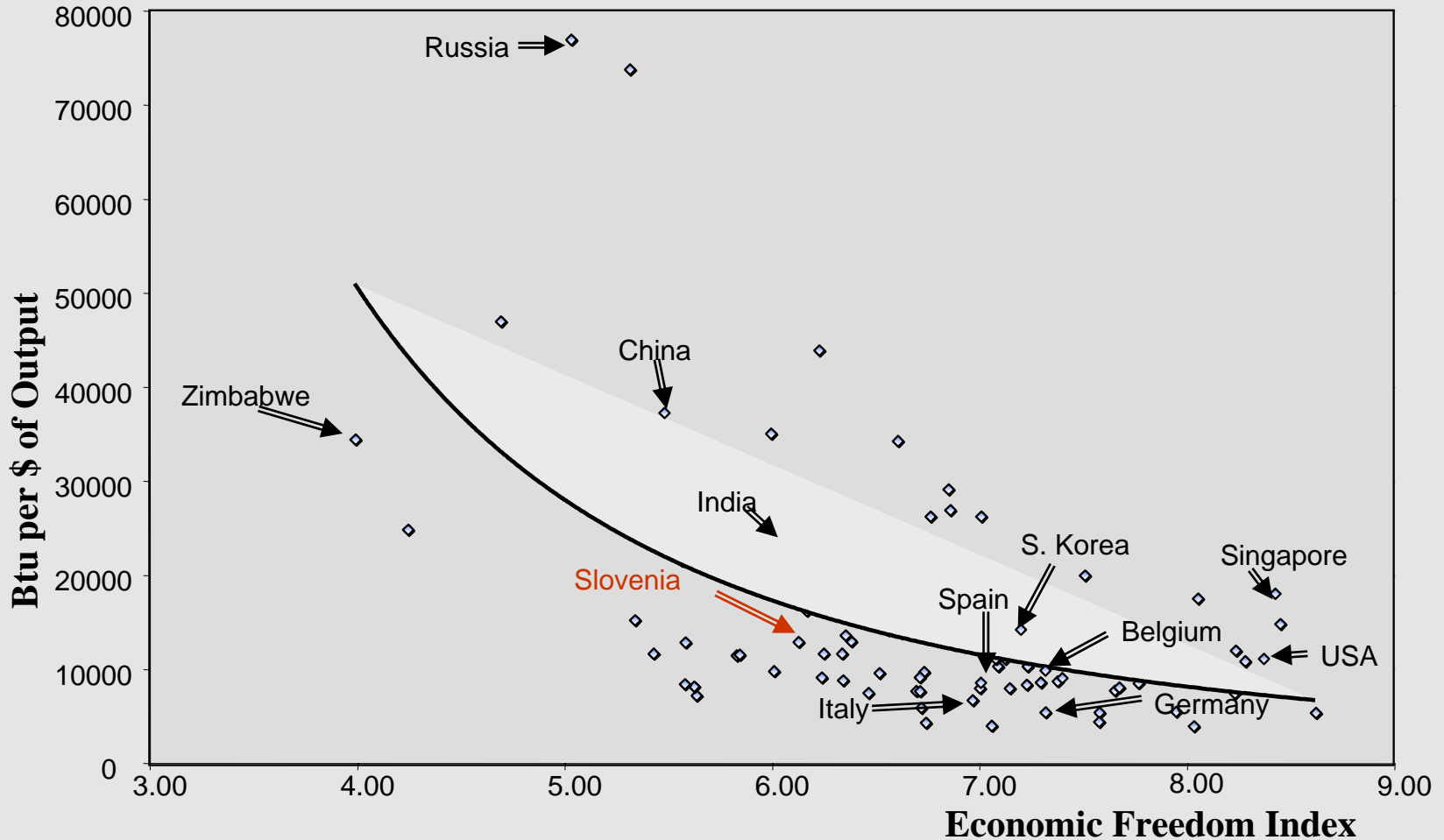
Economic Freedom and the Adoption of New Energy Technologies

- ❑ **Economic Freedom Promotes Improved Living Standards:** protection of investment, openness of internal markets, overall share of output absorbed by government, political freedom
- ❑ **Faster Economic Growth:** associated with adoption of new energy technologies which reduces energy intensity of emissions as living standards rise
- ❑ **Barriers to adoption of new technology:**
 - Pricing distortions
 - Lack of markets
 - Subsidies through State-run enterprises
 - Lack of protection for property rights including intellectual property
 - Restrictions on foreign direct investment
 - Lack of infrastructure, education, skills to handle new technology
 - Import restrictions



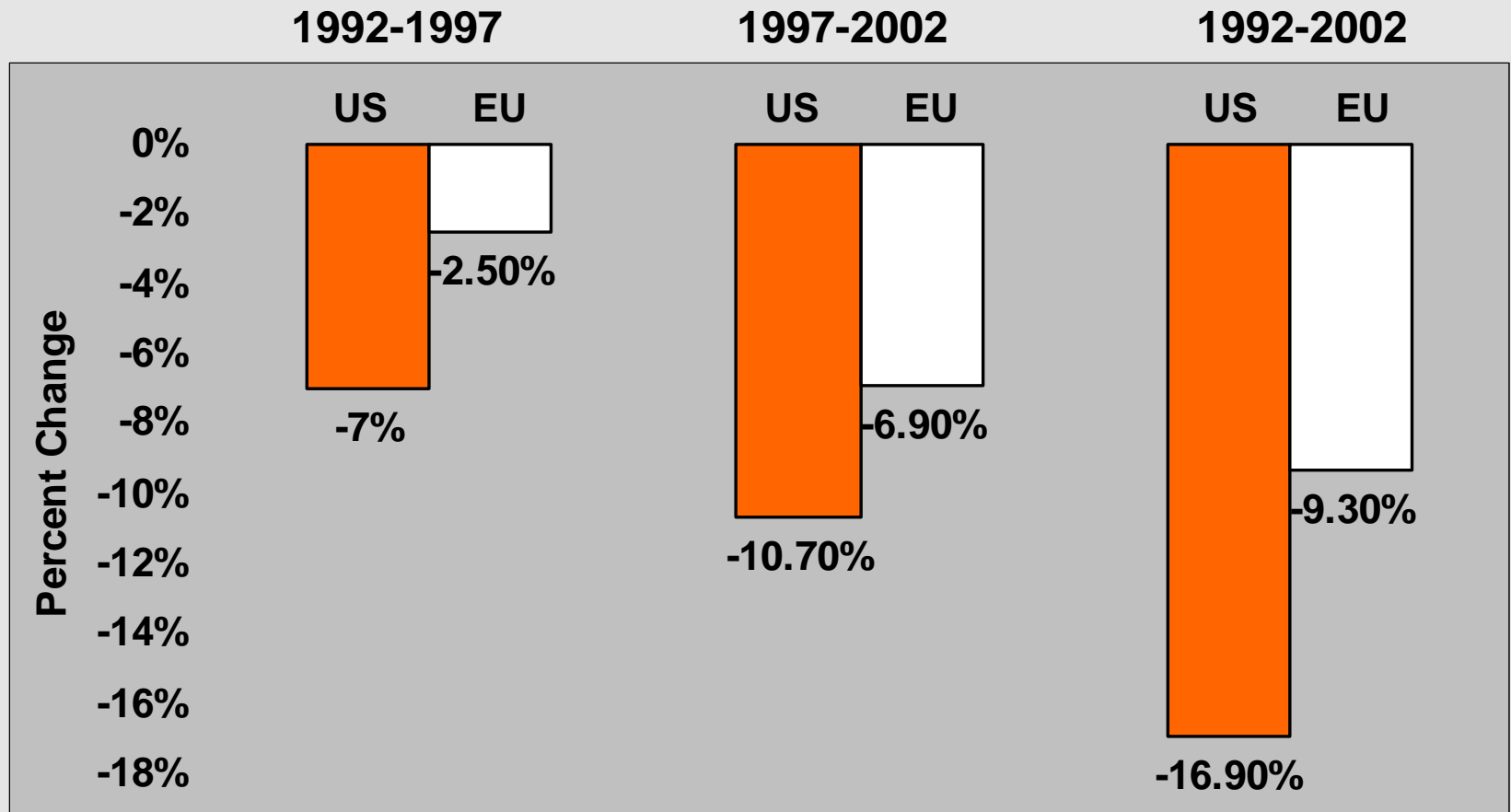
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Economic Freedom Compared to Energy Intensity in 2001





Comparison of EU and US Energy Intensity Reduction 1992-2002



Data: EIA International Energy Annual 2002



Practical Strategies to Address Economic Growth and Climate Change Policy

- Avoid policies which do not meet cost-benefit tests including mandated caps on carbon emissions from mobile and stationary sources
- Remove barriers to developing world's access to more energy and cleaner technology by promoting economic freedom and market reforms
- Increase R&D for new technologies to reduce energy intensity
- Develop sequestration through both natural and man-made technologies
- Promote nuclear power for electricity
- Expand bilateral cooperation with developing countries
- Promote a truly global solution such as the new Asia Pacific Partnership on Development