



Renewable Energy – Employment Effects

Ulrike Lehr



DIW Berlin















Background

- Germany supports RES with several instruments:
 - Feed-in tariff in the electricity sector
 - Subsidies in the heat sector
 - Use obligation in the heat sector (new!)
 - Support of R&D

- Study in 2006: Analysis of the effects of RES support on the labor market
 - Method development
 - Empirical foundation
 - Special focus on export
 - Comparison of a target oriented scenario and a reference scenario

- Follow-up study in 2007:
 - Analysis of administration and science
 - New scenario analysis

Effects on employment

	Domestic money flow	International money flow	Domestic Employment
Investment in RES			
O&M			
Investment in fossil fuel facilities			
Export of RES facilities			
Import of RES facilities			
Public and Private Budgets			

How do we quantify these effects?

Investment in RES

O&M

Investment in fossil fuel facilities

Export of RES facilities

Import of RES facilities

Impact on employment



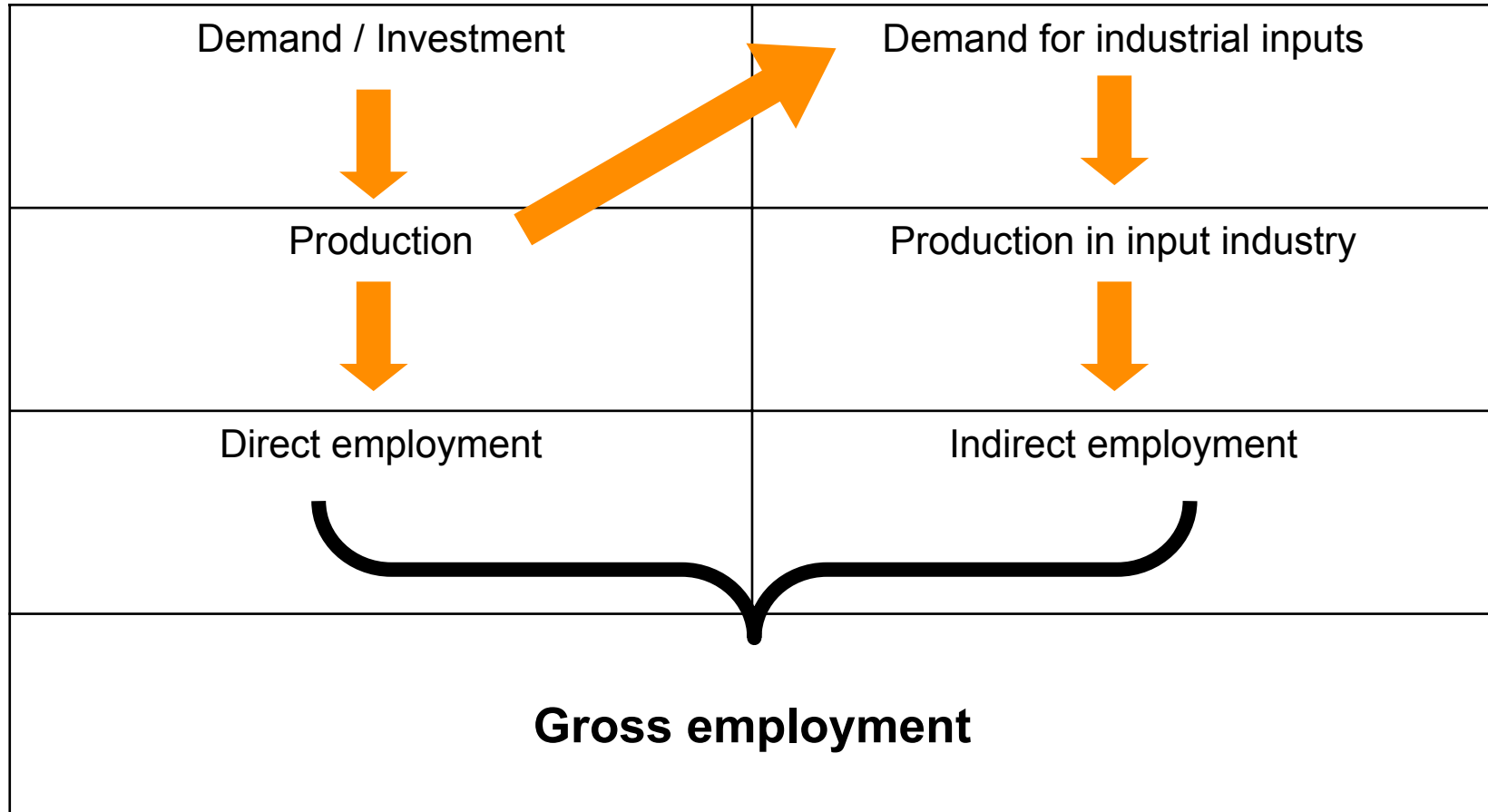
Base year : statistical data, survey
Future: Scenarios

Input-Output-Tables

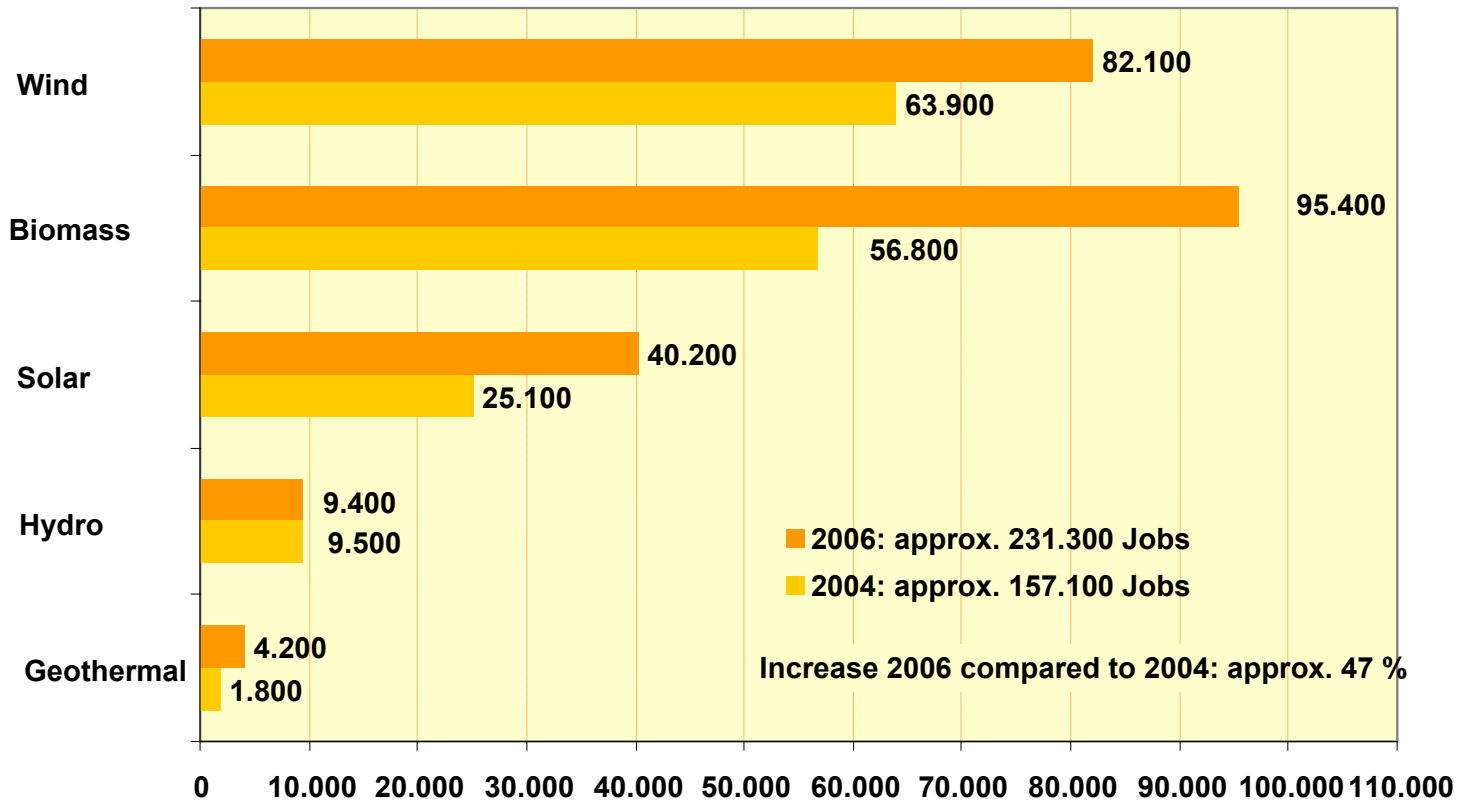
Impact on economic indicators, balance

Macro-economic model: PANTA RHEI

Calculation of Gross Employment



Gross employment in Germany (RES) 2004 and 2006



Employment effects of the RES support policy

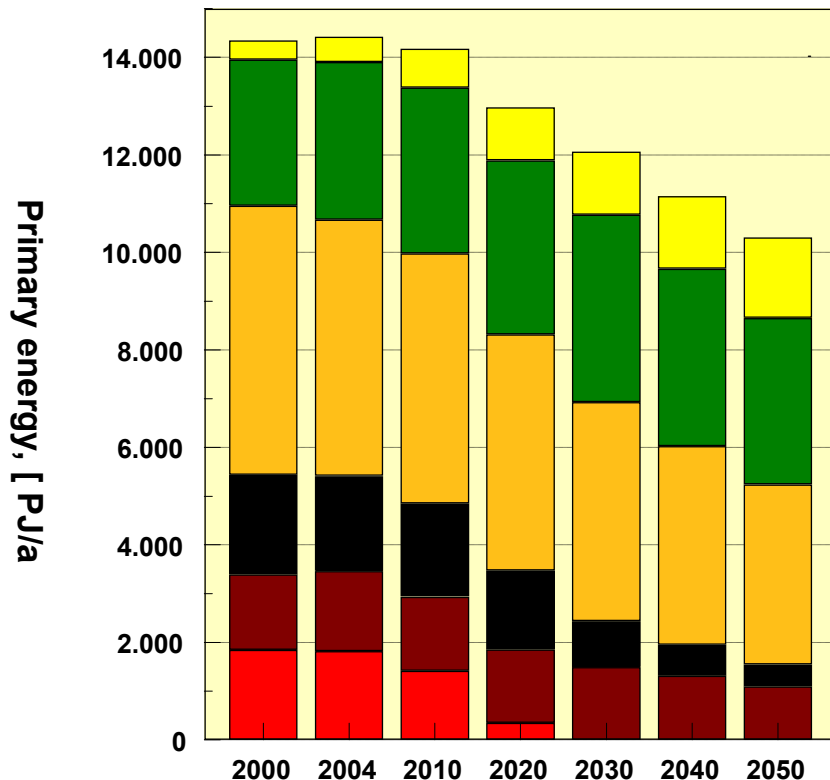
Economic effects of a certain policy can only be derived by comparison of two developments:

1. Development with a support policy
2. Development without / with lesser support

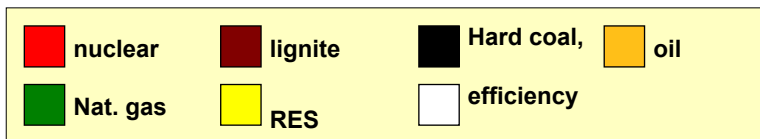
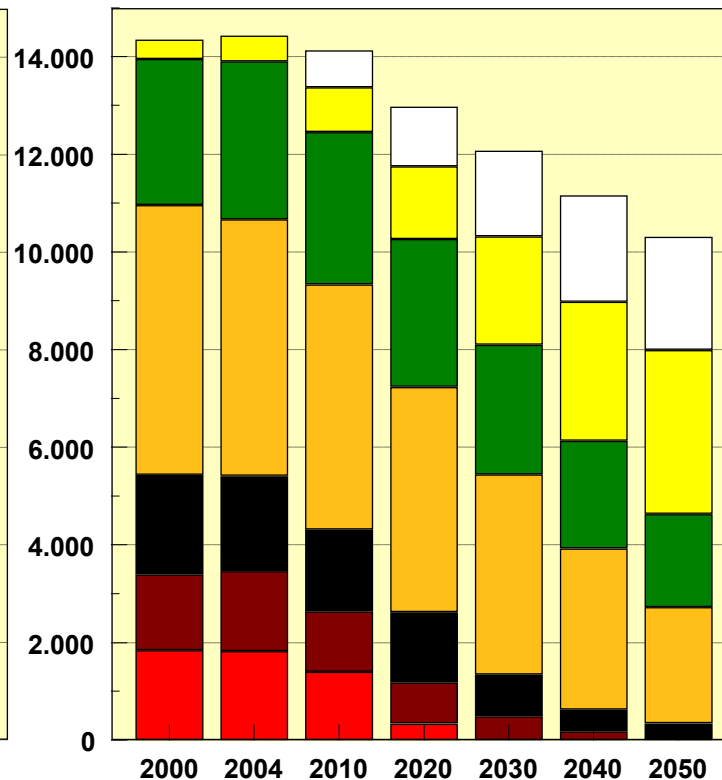
Result: Net economic effects!

Future development of gross employment

- Scenario Reference -

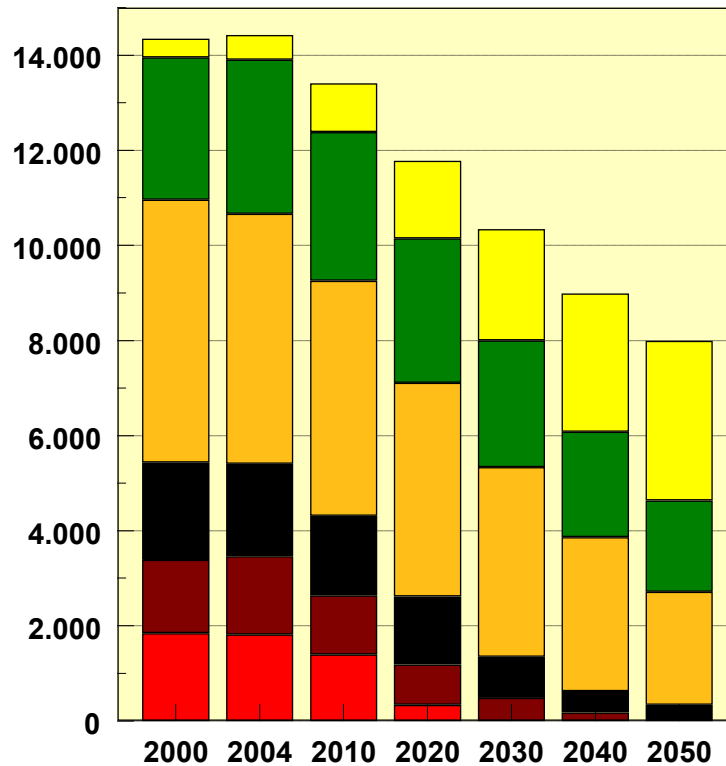


- Scenario NatPLus - 2005 -

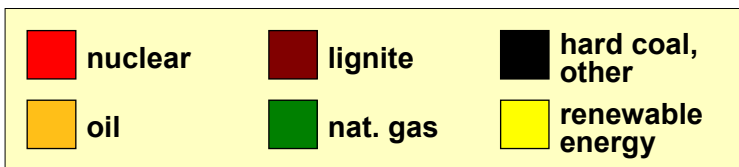
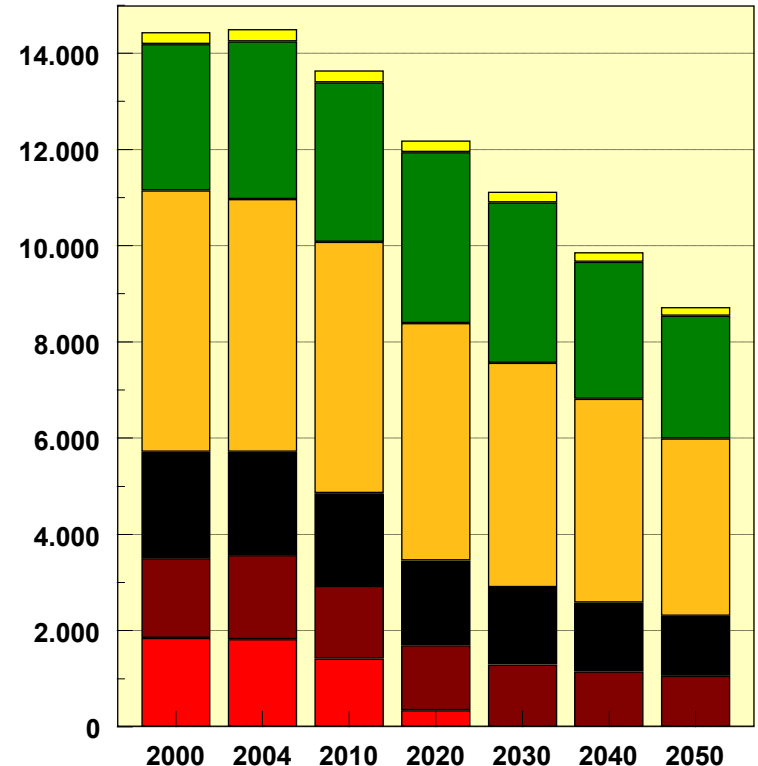


Future development of gross employment – frozen zero support

- Scenario NATPLUS - 2005 -

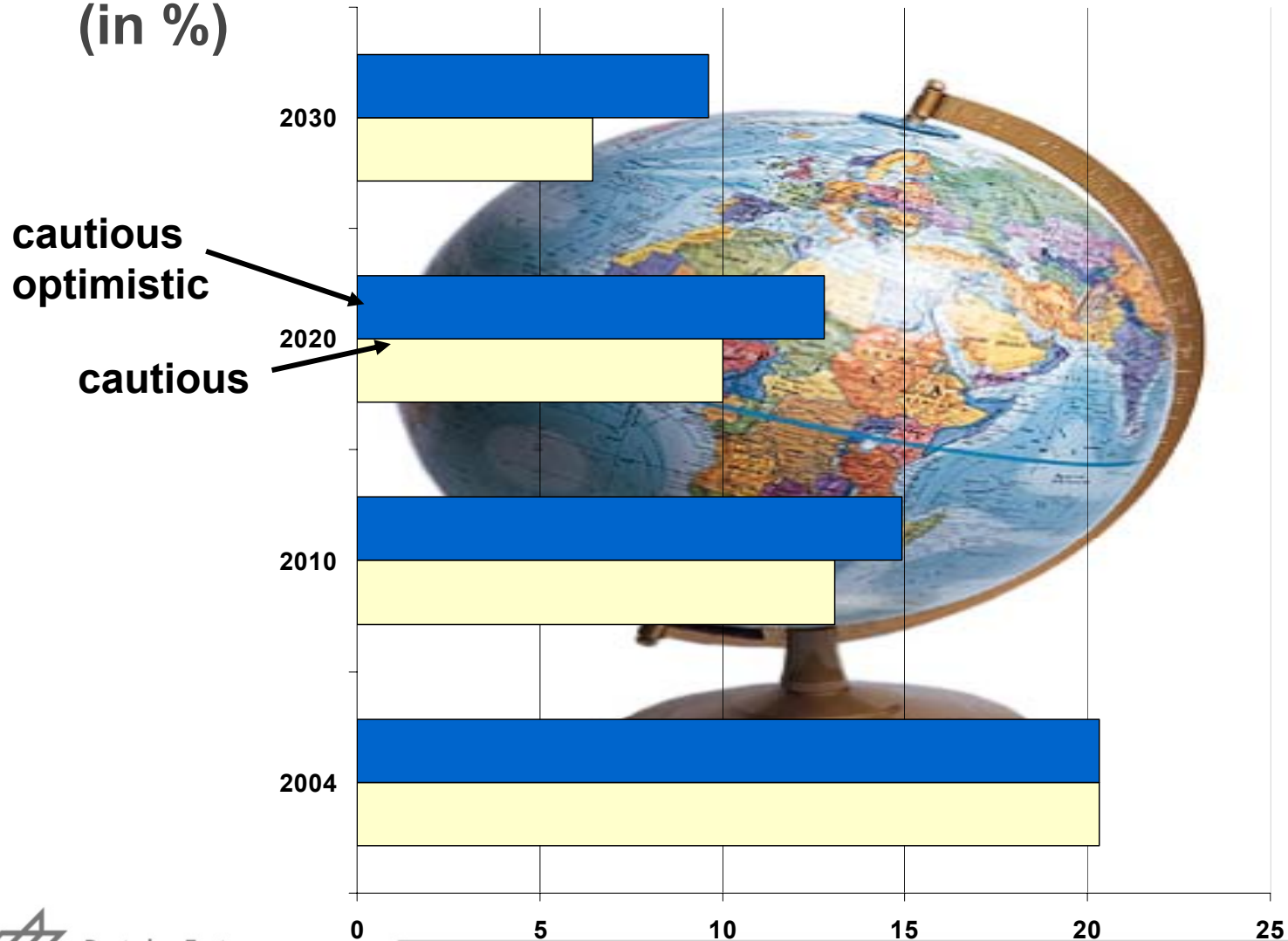


- Scenario EE-NULL -



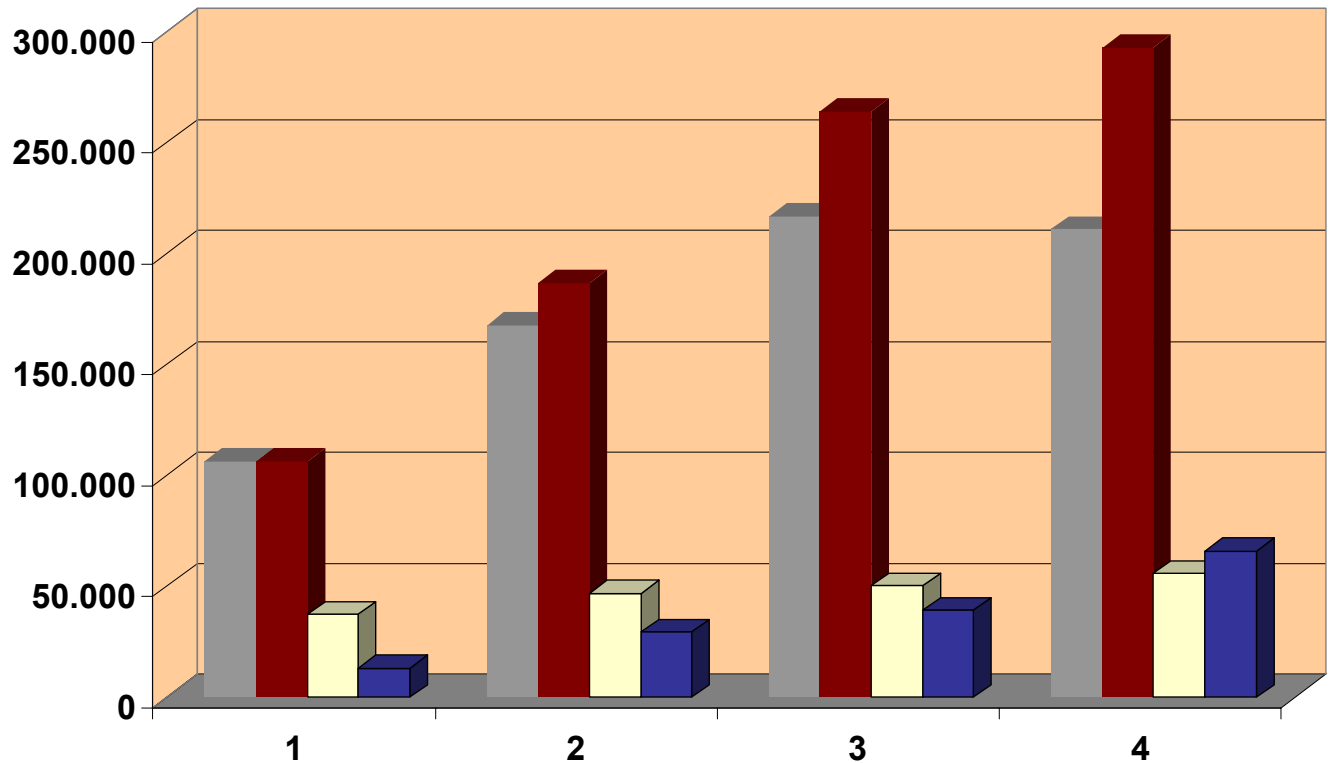
Primary energy, [PJ/a]

Shares of German firms (RES-E) in the world market (in %)



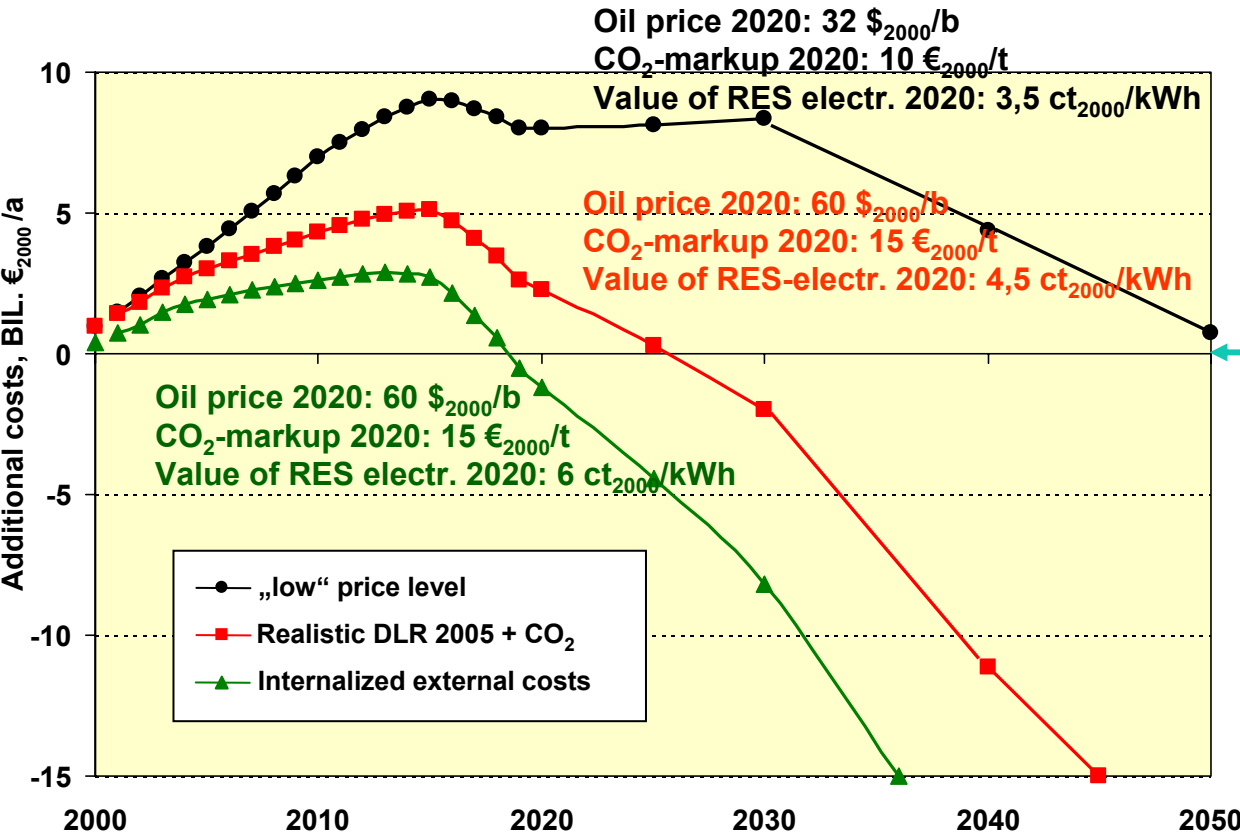
Gross employment (direct and indirect) 2004 to 2030

- Projection of productivity
- Projection of the direct/indirect ratio
- Scenarios



Private and public budgets are

- reduced by additional costs and
- increased by less imports of fossil fuels



Below this line RE can compete

➔ Additional cost will be negative within the next 20 years.

Results

With a cautious or a cautious optimistic scenario, net employment effects will be positive.

	2010	2020	2030
Cautious scenario	employees		
Gross	244.000	307.000	333.000
Net compared to reference	50.000	65.000	71.000
Net compared to Zero	60.000	80.000	120.000

BMU 2006, BMU 2007.

Open Questions

- Update of empirical base
- Regional aspects
- Method comparison
- Biomass / biofuel

Thank you for your attention!

For more:

www.dlr.de/tt/system

Lehr, Kratzat, Edler, Lutz, Nitsch (2007), Renewable Energy and Employment in Germany, Energy Policy 1/2008