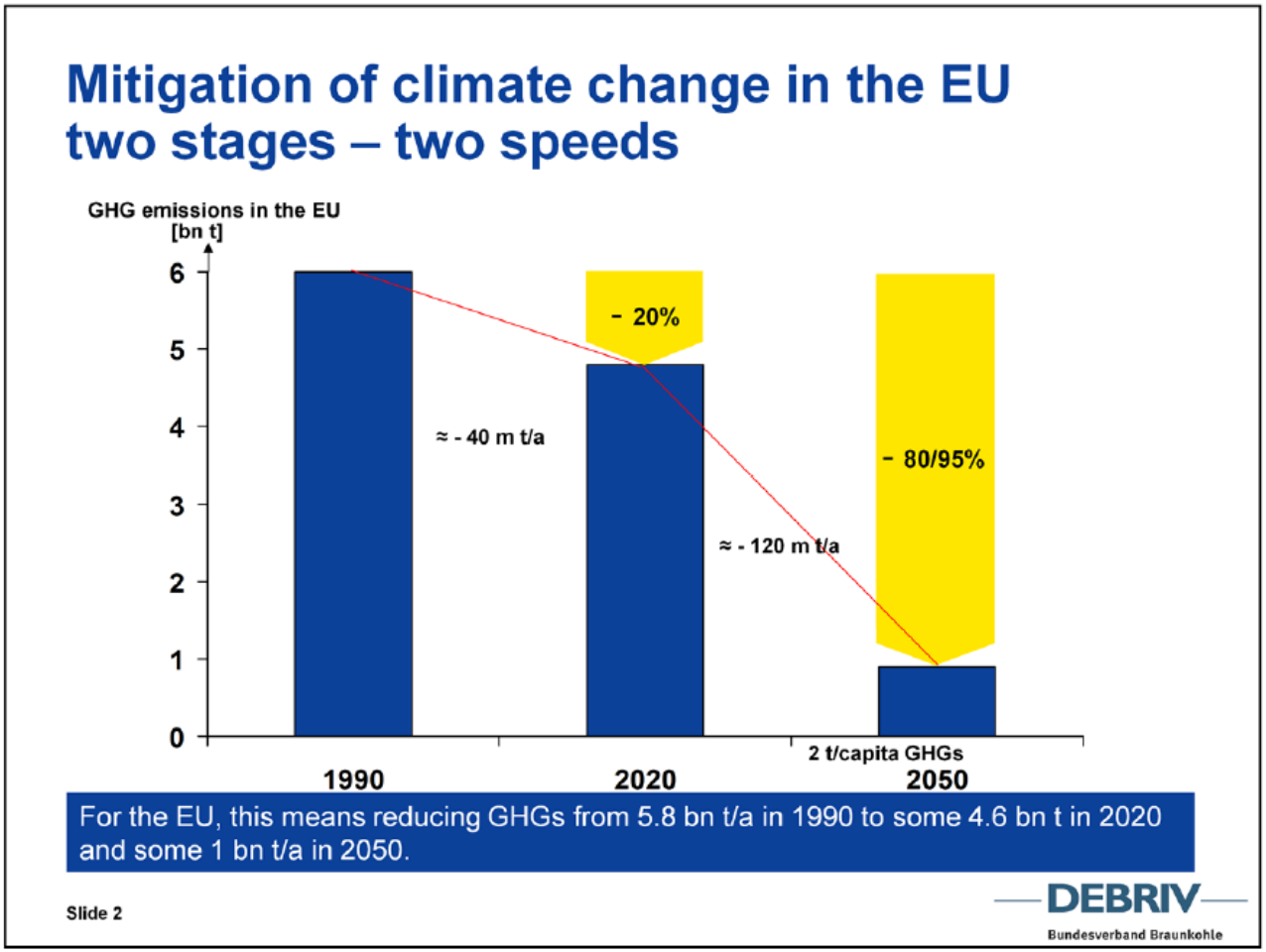
Center for Applied Economic Research
at University of Münster

Prof. Dr. Ulrich van Suntum

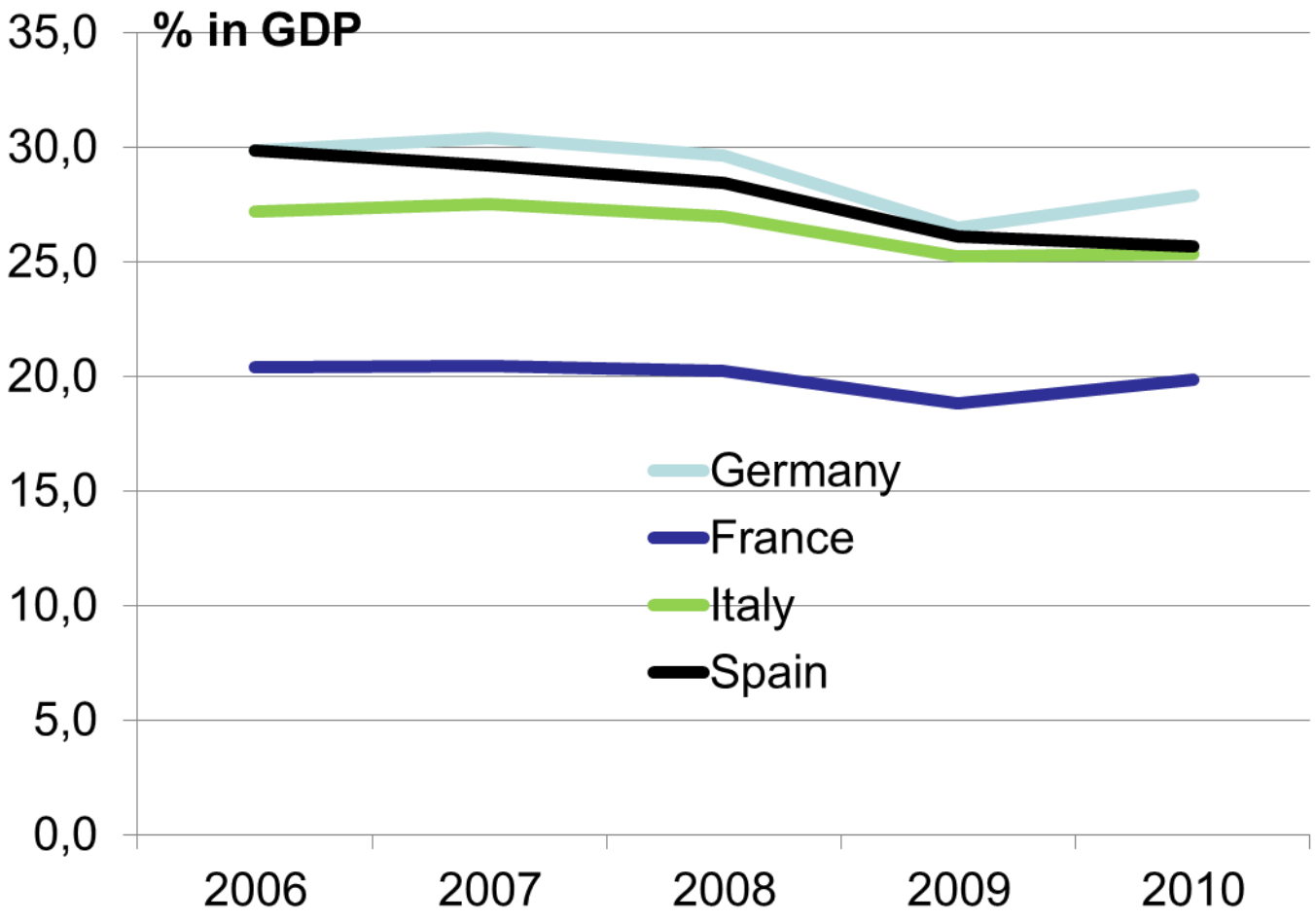
Benefits, design and financing of a CO2 transport and storage infrastructure

Presentation at European Round Table on Coal in Brussels, January 22th 2013

Ambitious EU-Targets on Greenhouse Gas Emissions

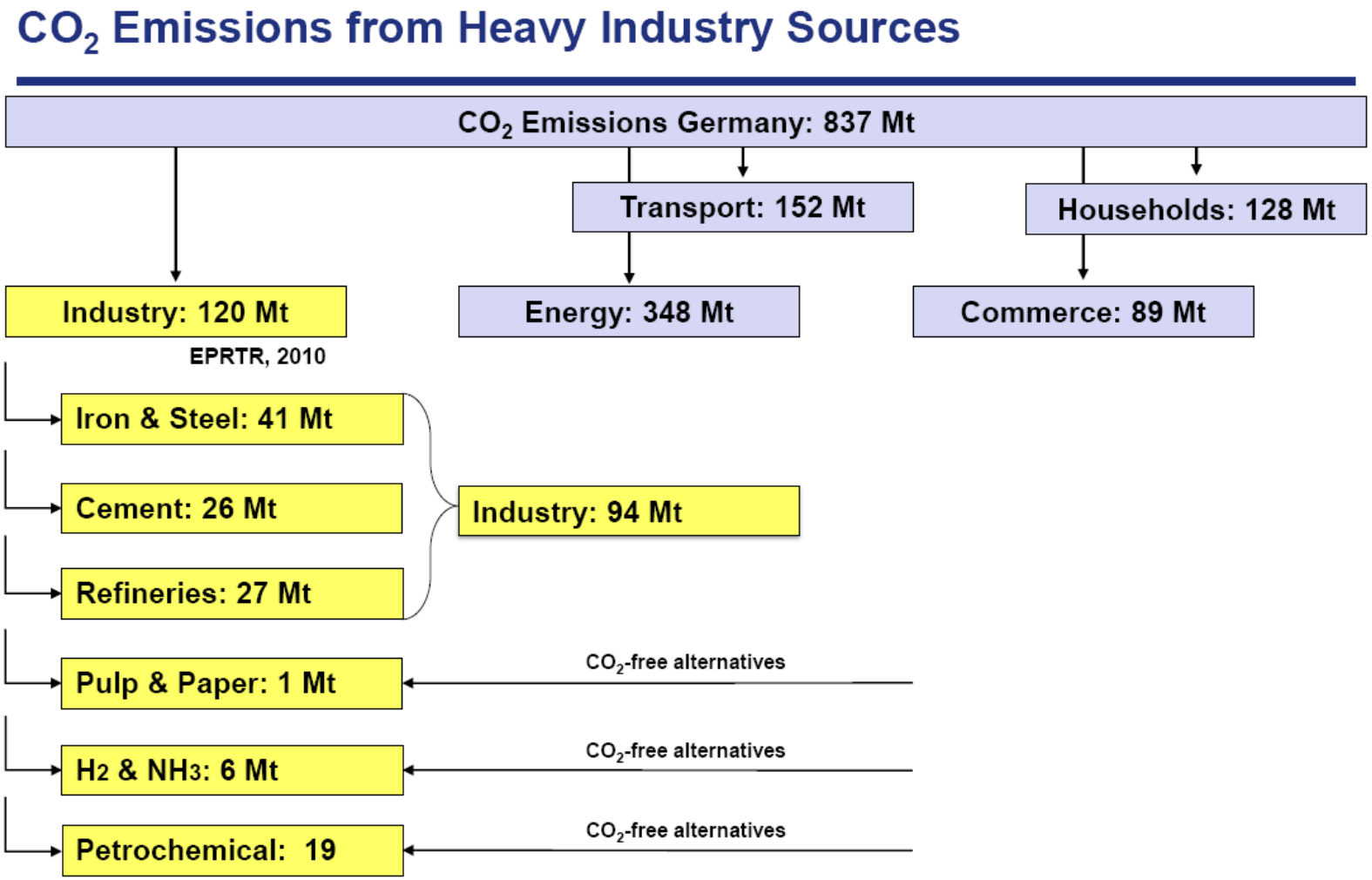


Decreasing industrial shares in GDP in the European Union

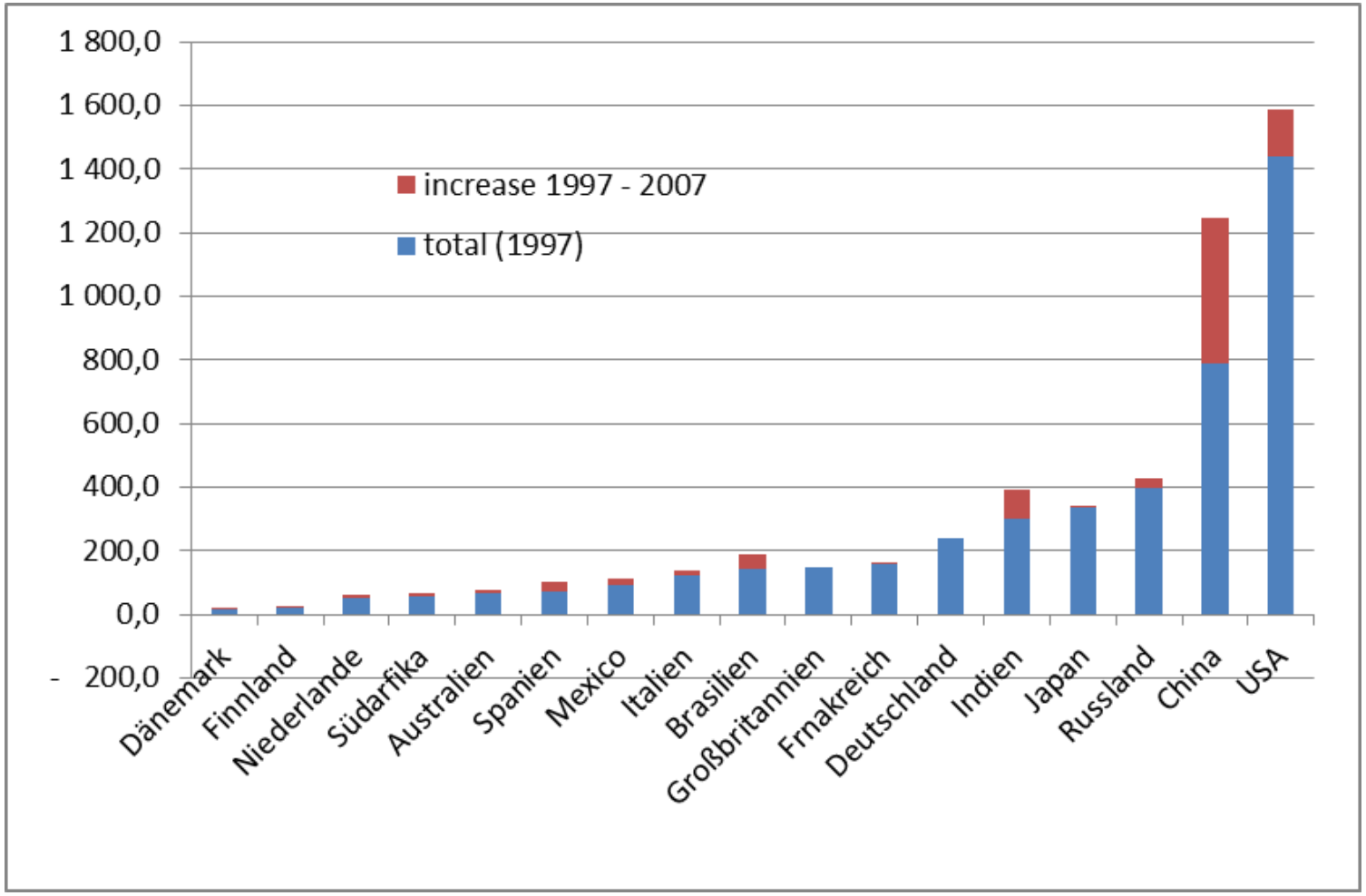


Industrial share of CO2-emissions 14%, energy-production share 41,5% in Germany

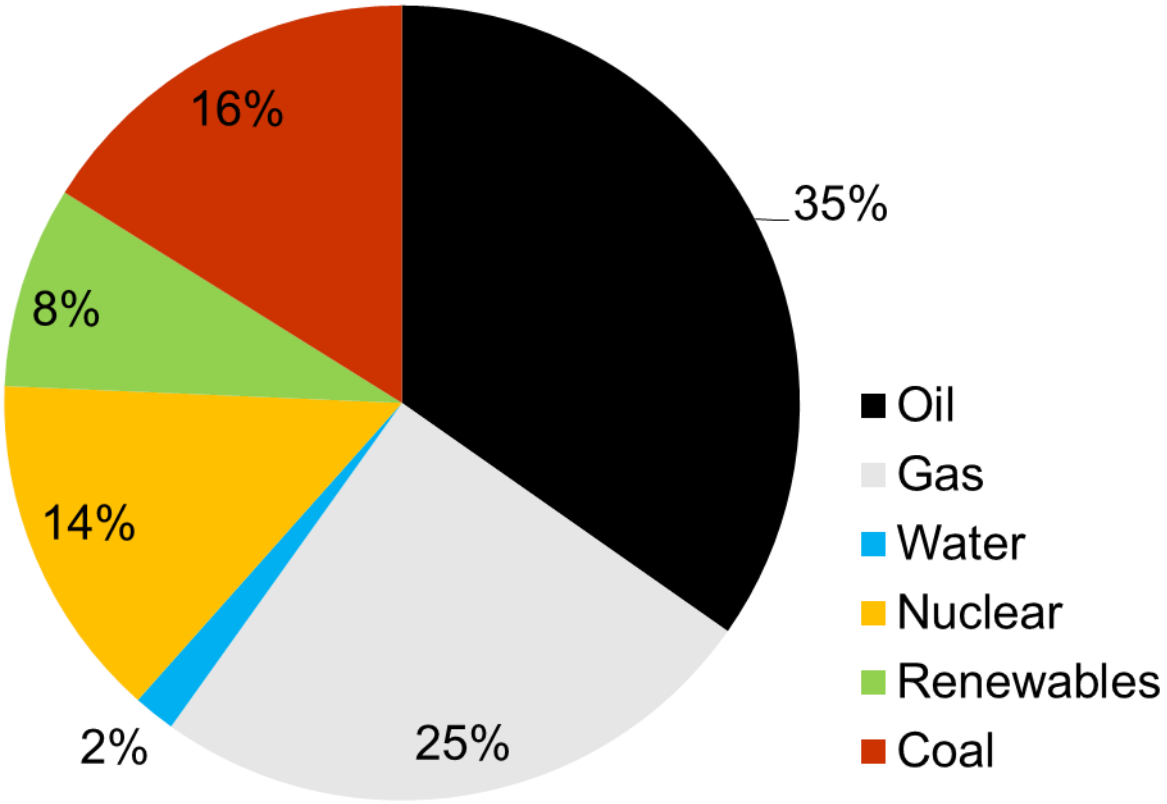
(source: von Hirschhausen 2011)



China`s increase in energy consumption higher than Germany´s total



Coal provides for 16% of EU-27 primary energy today



Source: IEA (2011)

EC memo 10/2012:

"Currently, industry accounts for about 16% of the EU's GDP. Strengthening the industrial base of the Union would require reversing the declining industry trend observed for a long period of time, to approach 20% of GDP by 2020"

Possible routes of CCS infrastructure in Europe

(source: DIW/Hirschhausen)

Ergebnisse ausgewählter europäischer Szenarien

(für 2050)

Szenario	Anteil der CO_2-Abscheidung in der Industrie	Pipelinenetzwerk	Gespeichertes CO_2	Verbleibendes Speicherpotential
	in Prozent	in Kilometern	in Gigatonnen	
On 50	100	6 600	5,6	88,4
Off 50	100	4 300	2,1	47,9
On 75	63	20 400	15,8	78,2
Off 75	65	9 800	7,5	42,5
On 100	53	23 600	24,7	69,3
Off 100	57	37 400	19,0	31,0

Szenario	Investitionskosten	Kumulierte variable Kosten
	in Millionen Euro	
On 50	81	134
Off 50	40	58
On 75	240	515
Off 75	145	266
On 100	380	929
Off 100	359	796

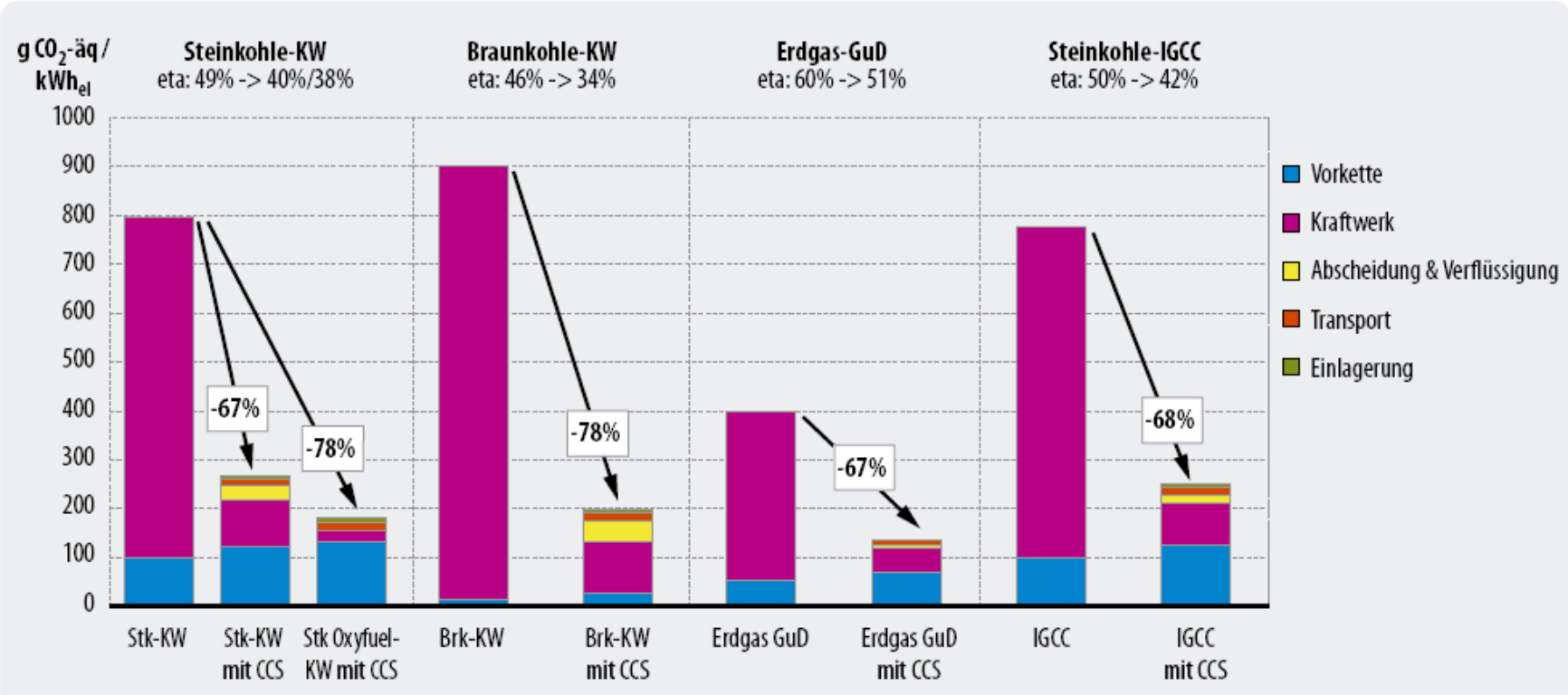
Core questions to be answered by a study on CCS infrastructure

- What is the climate and energy policy significance of CCS in Central Europe?
- What could be the consequences of the absence of a CCS infrastructure concerning the future prospects of industry in Europe and their role for the European economies as a whole?
- Which options do we have for the development, financing, and operation of a CCS infrastructure in Central Europe?

Potential impairment of CO2-emissions

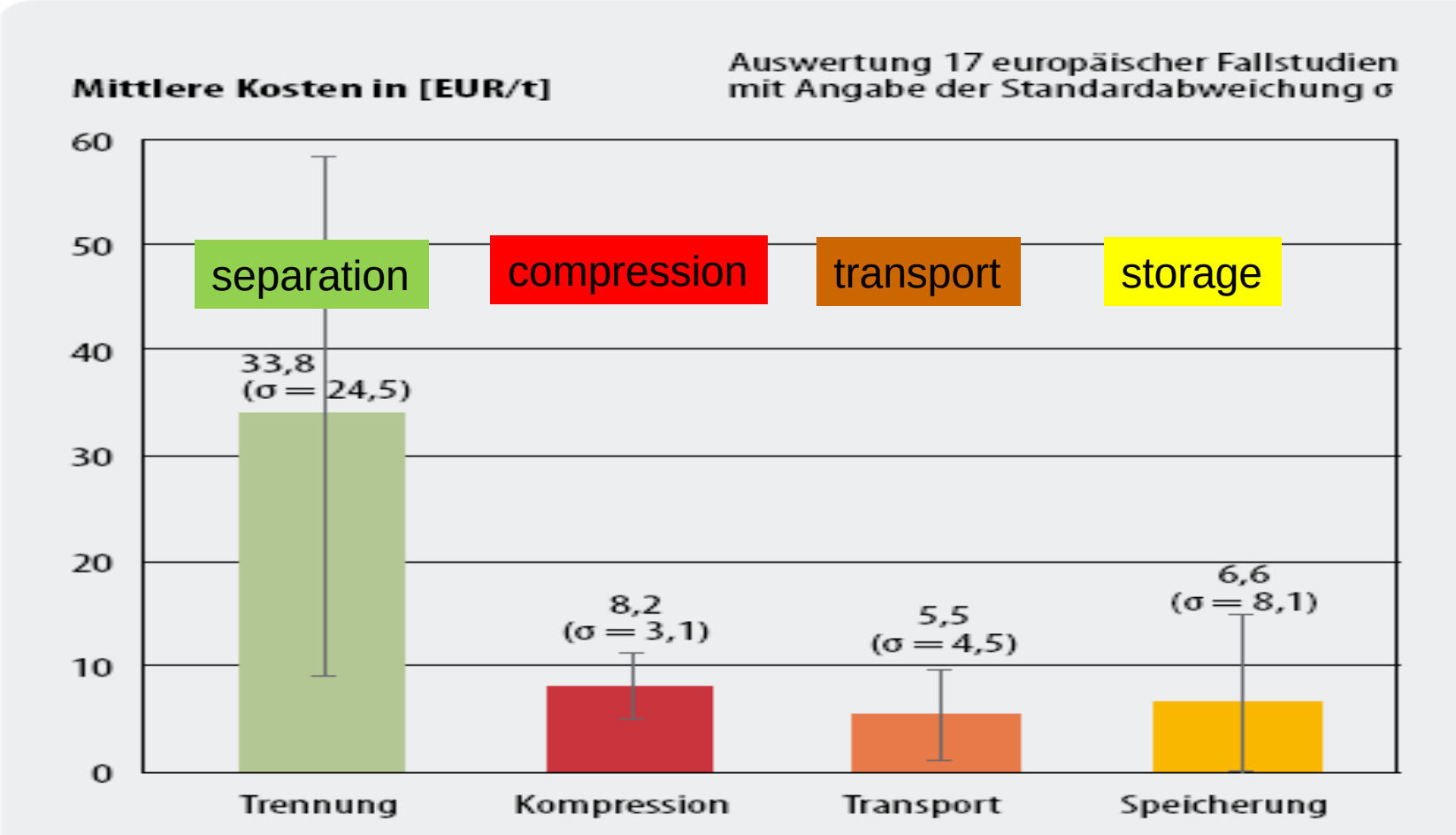
(Source: Wuppertal-Institut u.a., reccs-report 2007)

Steam coal lignite Natural gas

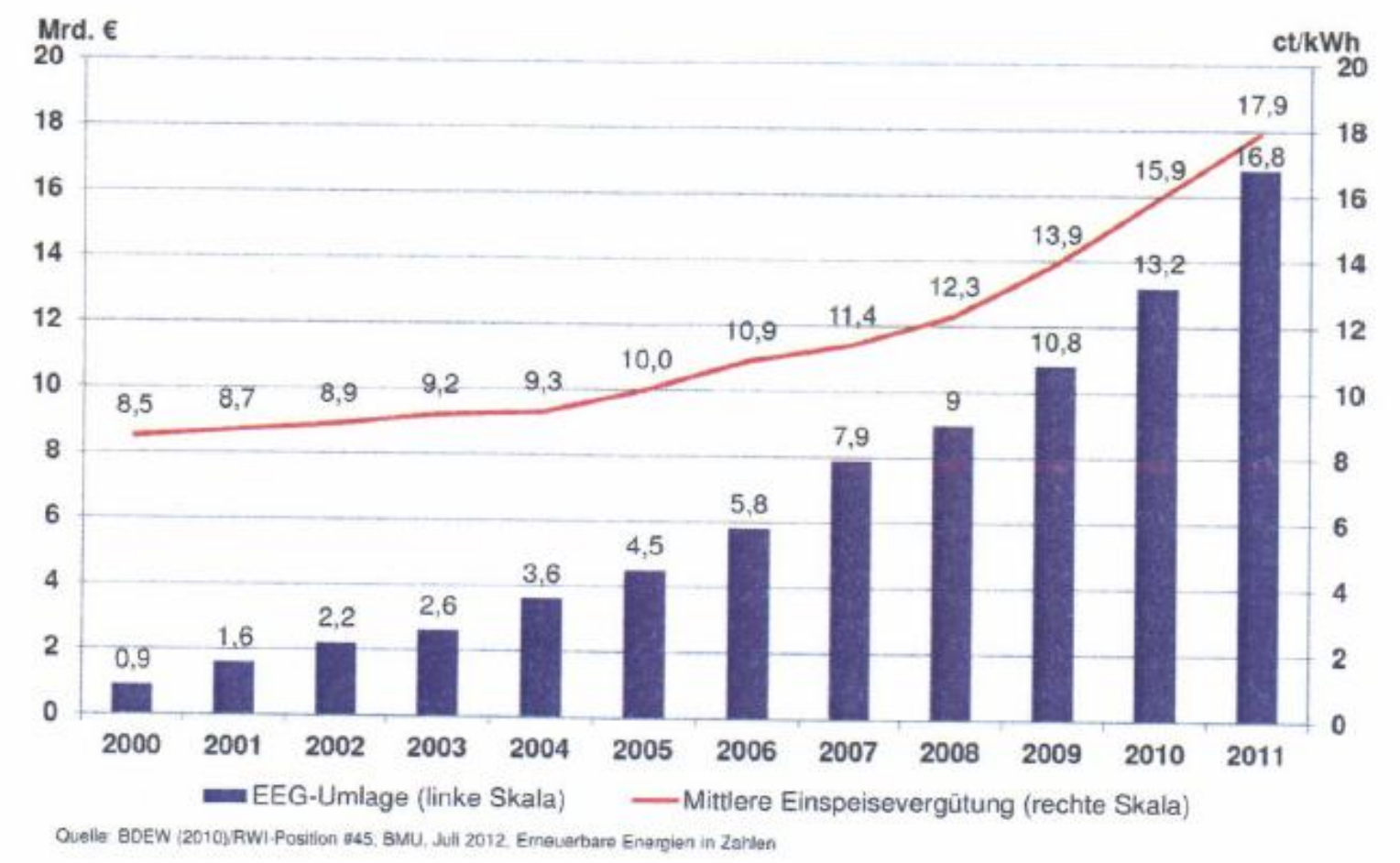


70% of CCS costs are for separation and compression

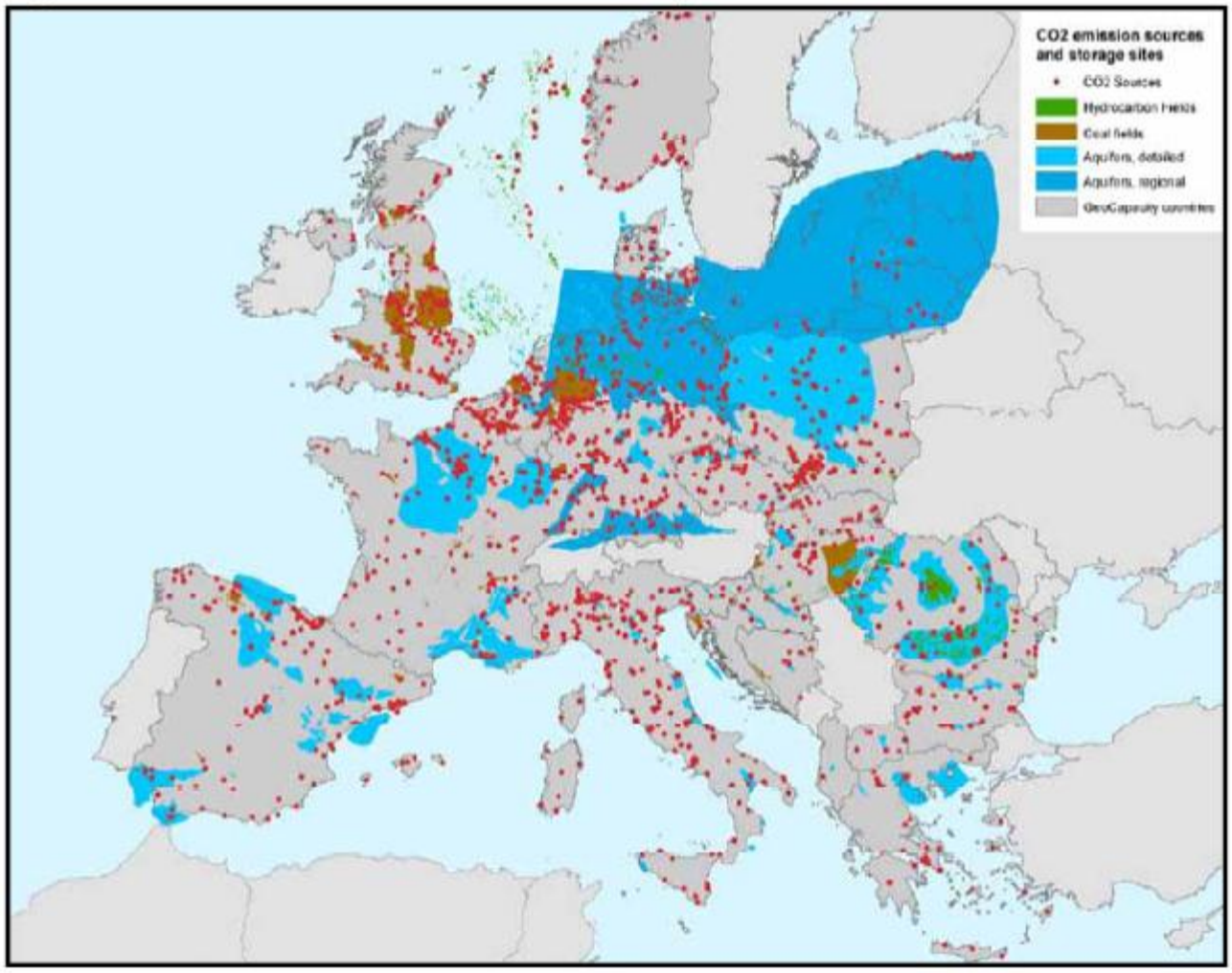
(source: Wuppertal-Institut u.a. , reccs-report 2007)



Costs for renewable-subsidies rise exponentially in Germany

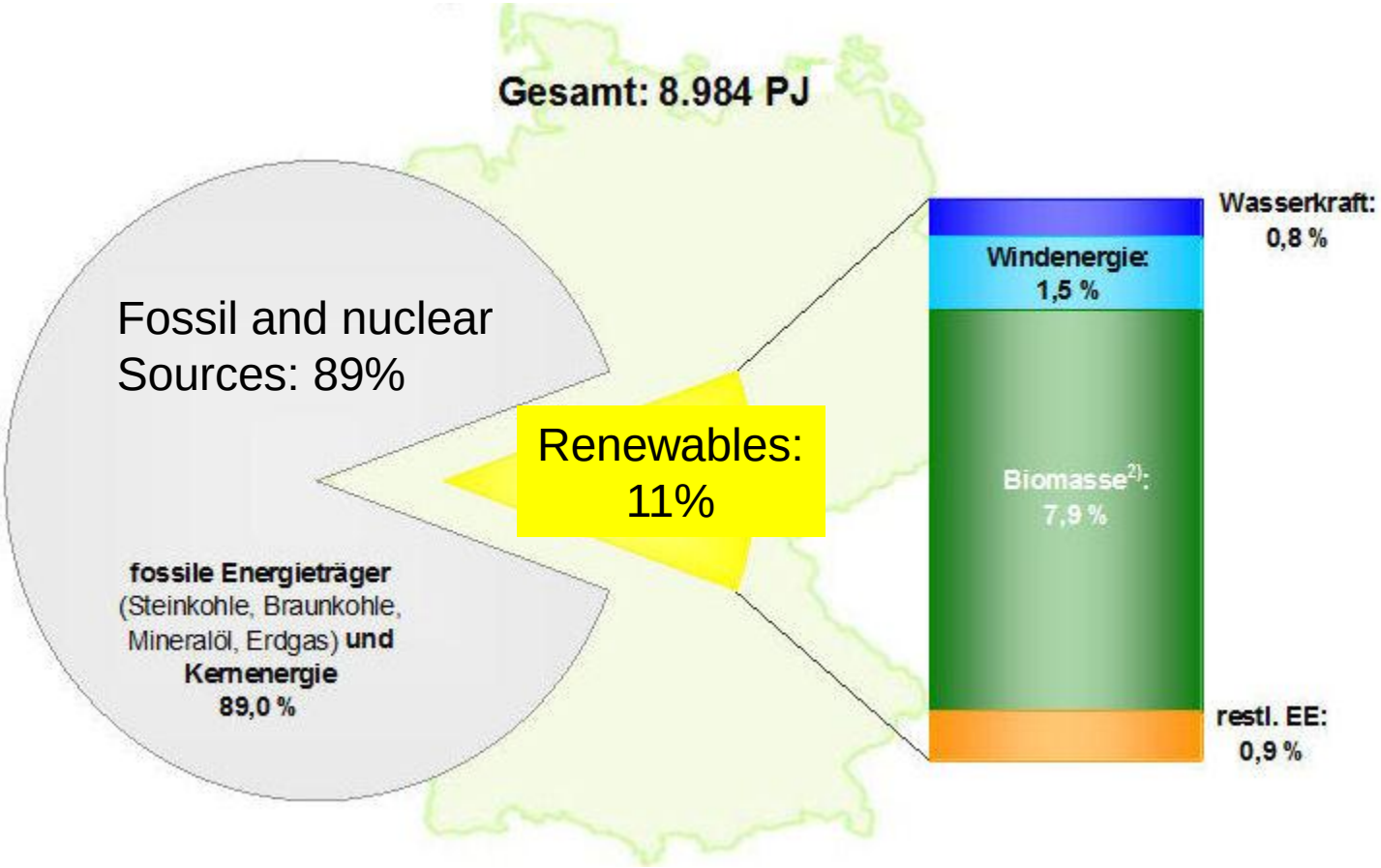


CO2-sinks and -sources in Europe
(source: Wuppertal Institut/Hirschhausen 2010)



Fossil and nuclear energy sources have still a share of 89% in Germany`s primary energy supply

(source: BMU)



High numbers of small and medium CO2 sources in Europe

Major CO_2 sources in Central Europe

	Number of operations > 10 m t/a	Number of operations 10 – 3 m t/a	Number of operations 3 – 0.35 m t/a	Total CO_2 emissions of selected operations, in m t/a
Netherlands	0	10	33	86
Belgium	0	5	33	51
Germany	9	23	153	434
Poland	2	10	56	162
Czech Rep.	0	8	33	74
Total	11	56	308	807

Source: EPER 4/2009 – Data for 2004

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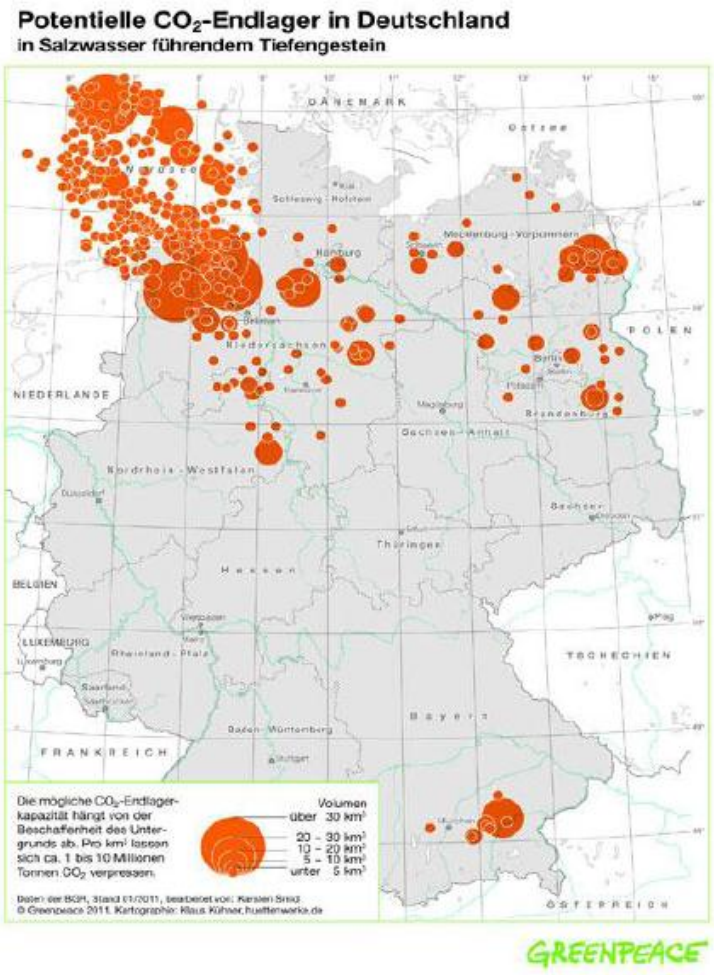
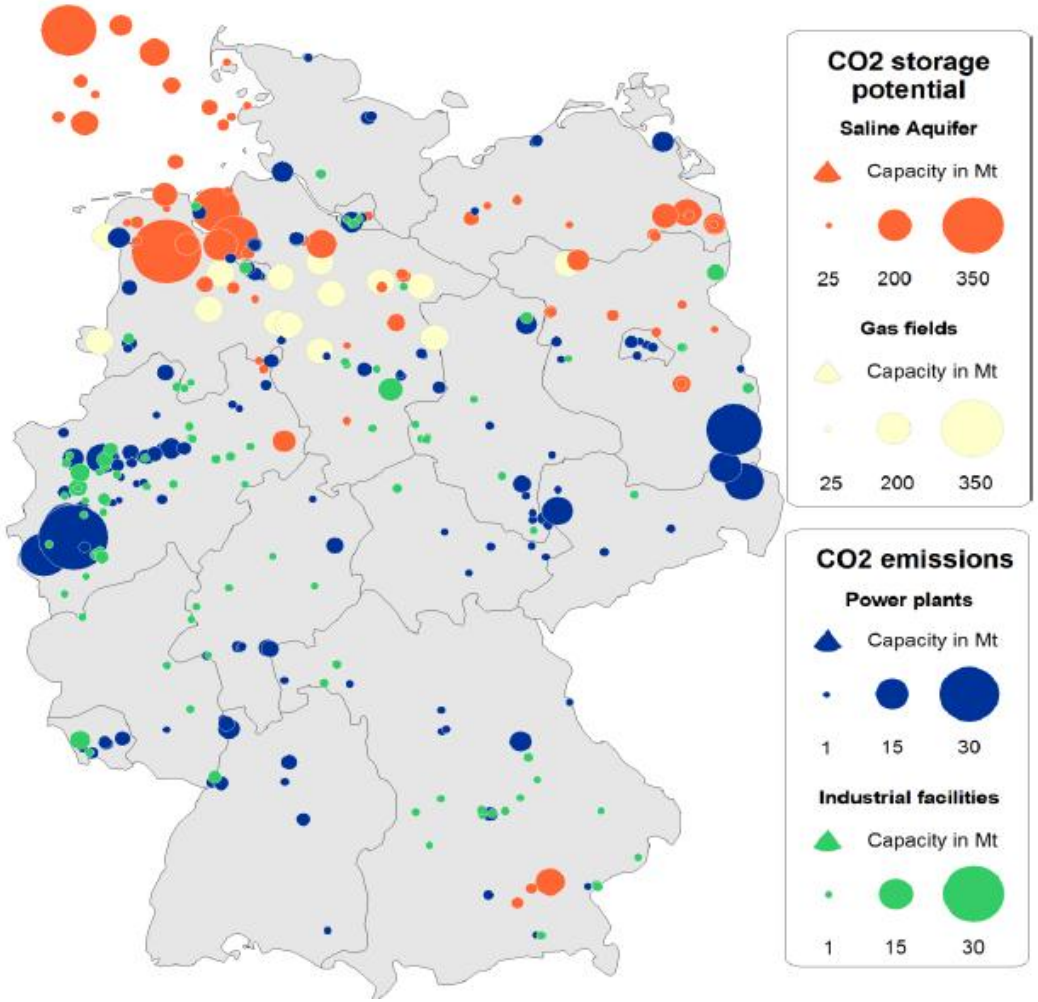
DEBRIV Bundesverband Braunkohle

CO2 sources and sinks in Germany

(Quelle für Abb: C.v. Hirschhausen)





Core questions to be answered concerning a CO2 transportation infrastructure

- What is the optimal size and shape?
- Who should pay for the costs?
- What would be an appropriate tariff structure?
- Who should provide and operate the infrastructure?

Thank you for your kind attention