Co-benefits: increasing chances of a global transition to low carbon energy

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CLIMATE CHANGE MITIGATION: GLOBAL PUBLIC GOOD

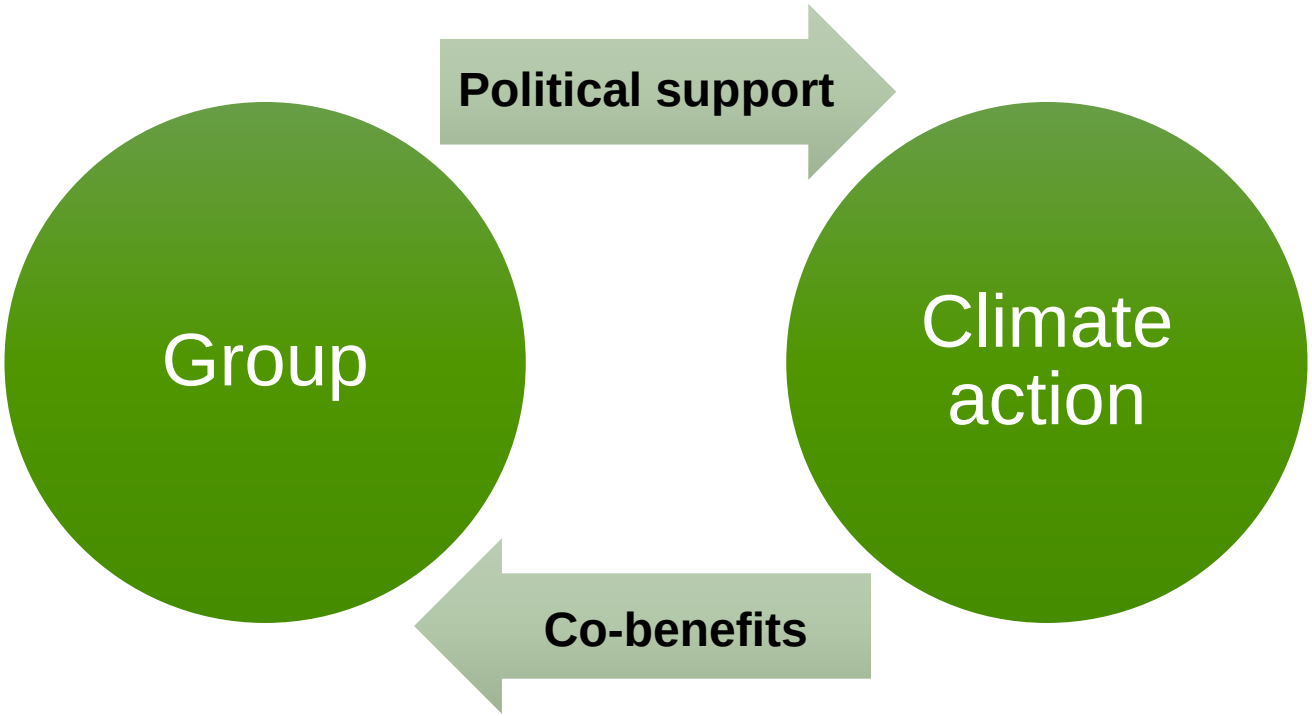
Cost-benefit analysis: own risks and costs to act

	Low costs	High costs
Low risks	**Moderate**	**Minimum**
High risks	**Maximum**	**Moderate**

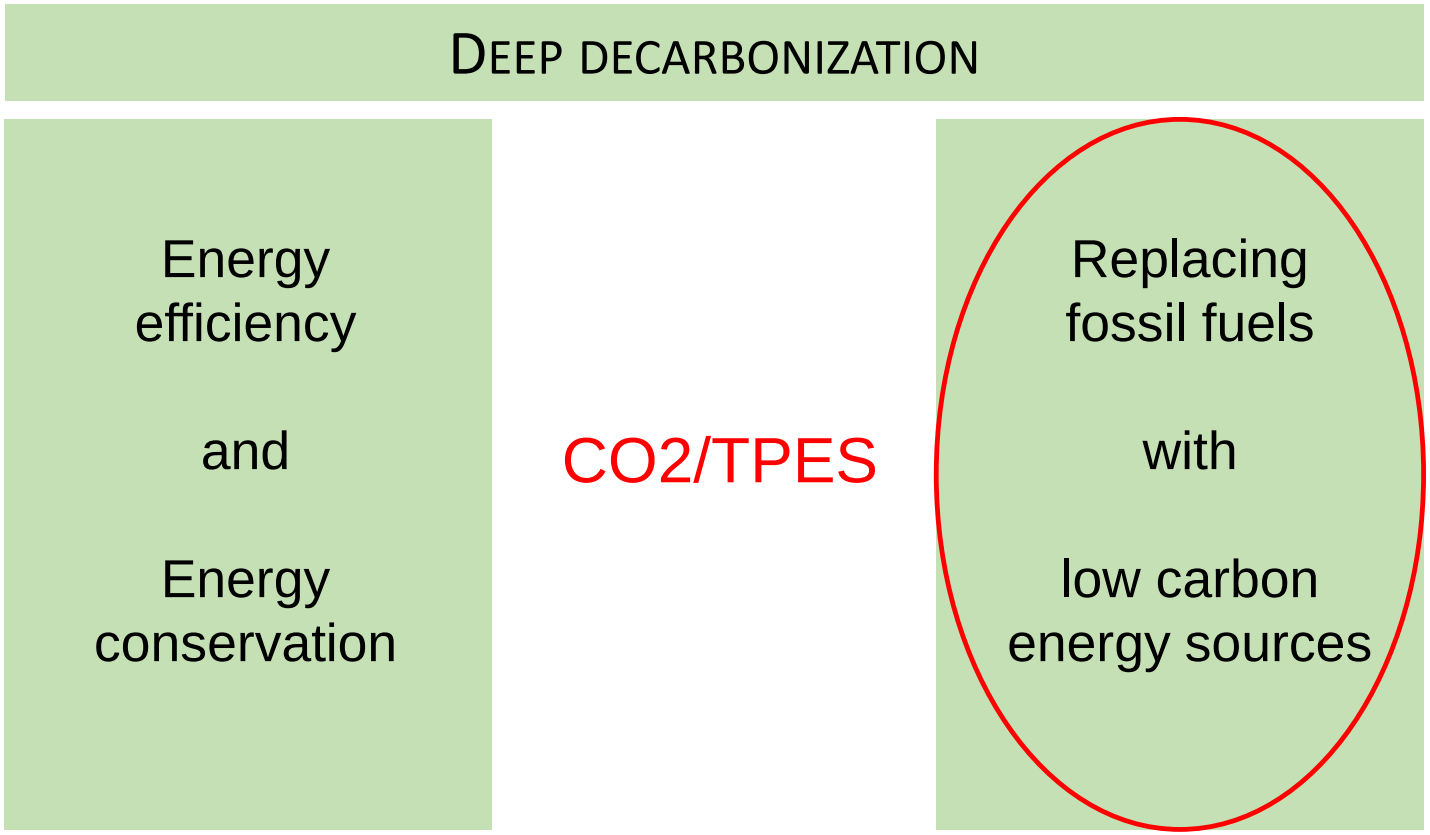
International and domestic politics: polyarchy (Milner)

- Distributional consequences of climate policy
- Climate concerns among, not alone, in informing preferences

ADDITIONAL BENEFITS OR CO-BENEFITS



DEEP DECARBONIZATION



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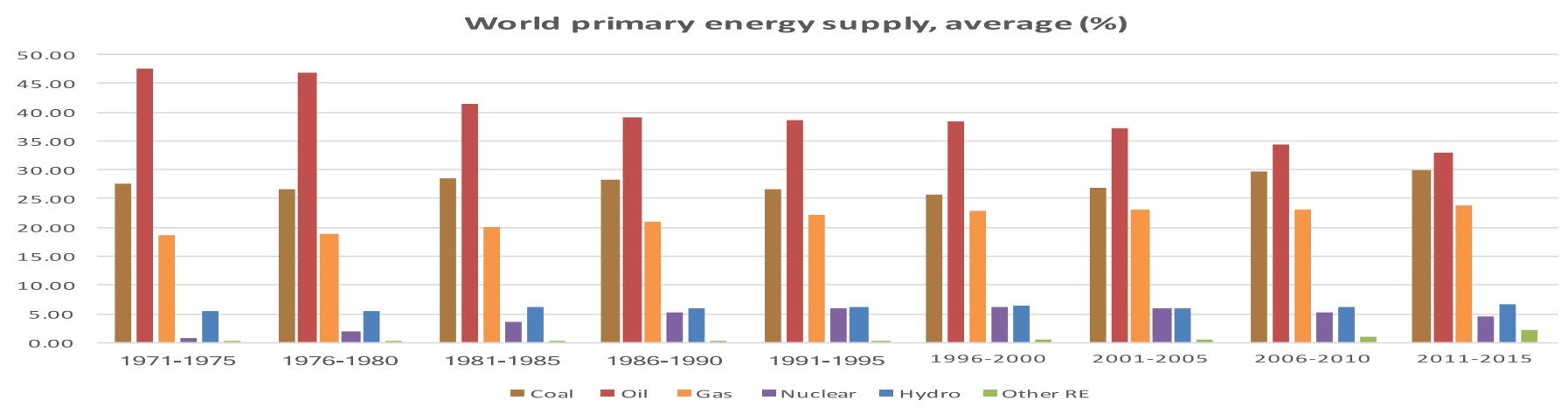
World primary energy supply, average (%)									
	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015
Coal	27.53	26.69	28.46	28.35	26.68	25.59	26.97	29.79	29.96
Oil	47.54	46.74	41.42	39.08	38.58	38.50	37.13	34.39	32.97
Gas	18.54	18.88	20.14	21.00	22.15	22.82	23.18	23.17	23.75
Nuclear	0.88	2.06	3.64	5.31	5.93	6.16	6.03	5.33	4.50
Hydro	5.44	5.54	6.20	6.02	6.28	6.46	6.05	6.23	6.63
Other RE	0.06	0.08	0.15	0.24	0.38	0.47	0.65	1.09	2.19
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00



Source: Own elaboration and calculations, based on data from BP, 2017. Other RE include wind, geothermal, solar, biomass and waste; biofuels not included.

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RESULTS

(1) Carbon lock in:

- Fossil fuels: still more than 80% of global TPES;
- Coal and gas replaced oil;

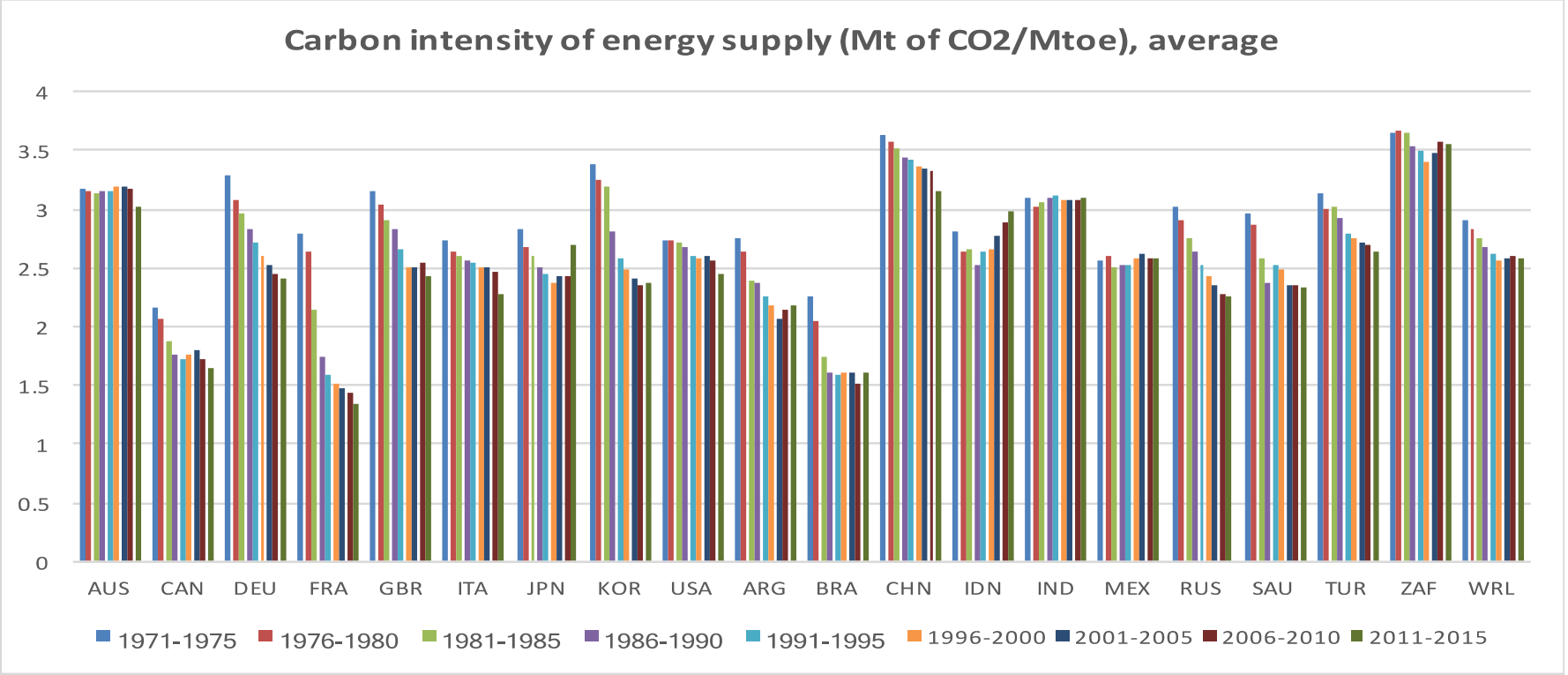
(2) Decreasing CO2/TPES (6.26%): gas and nuclear

- Gas: 18.74% (1971-1975); 23.75% (2011-2015)
- Nuclear: 0.88% (1971-1975); 6.16% (1996-2000); 4.50% (2011-2015)

(3) Comparing pre-1990 vs. post-1990:

- Continuity, not rupture (except Other RE)

G20: CARBON INTENSITY OF ENERGY SUPPLY



Source: Own elaboration and calculations, based on data from IEA, 2017. Consider: Russia, from 1971 to 1989, is USSR.

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CASE STUDIES

Why countries replace fossil fuels with low carbon energy sources (nuclear, hydro, other RE)?

- Which objectives (and group interests) drive it?

  Additional benefits = not climate change mitigation
- If present before 1990, could they still be driving it?

Analysis:

- Reconstruct trajectory of energy politics and policies
- Identify groups and their interests

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GERMANY

(1) Before 1970s: rebuilding the economy

- Cheap energy: coal (German reserves) and oil
- Nuclear: dominate the technology

(2) 1970s-1990: environmental concerns

- Fossil fuels (particularly coal) = sulphur = acid rain
- Chernobyl accident = anti-nuclear campaign
- Political space for pushing RE

(3) After 1990: climate change

- RE = benefits to the environment and to the economy

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Brazil

(1) Before 1970s: hydropower already strong (19th C)

- Little coal, poor; oil: small reserves, onshore

(2) 1970s-1990: strategic development (military)

- Massive investment in hydro and oil (offshore)
- Pro-Alcohol program
- Nuclear = not an option (costs + opposition)

(3) After 1990: role of climate change?

- New RE: national components
- 2001/2002 supply crisis: thermal-fired power plants
- Use of oil prices as heterodox economic tool

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China

(1) 1978-1990: reforms and economic growth

- Coal production: energy security, prices
- Energy access (millions)
- 1980s: air pollution mounts

(2) After 1990: air pollution + exports strategy

- First pieces of regulation to reduce air pollution
- Massive investment in RE: pollution + development
- 2000-2010s: fastest growth of RE and nuclear (19 in construction)

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CONCLUDING REMARKS:

- Co-benefits help explain low carbon energy
- Context-defined, but some repeat
- E.g.: energy security plays a key role since the 1970s

Energy-related climate action:

- cannot be explained without taking them into account

Further research:

- Case studies – international climate commitments
- Check intervening variables

Thank you!

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