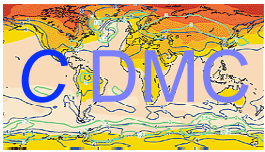




RESOURCES
FOR THE FUTURE



Offsetters Climate Neutral
Society



Adopting Carbon Trading & Green Strategies to Grow Businesses

Hadi Dowlatabadi
Canada Research Chair Prof., UBC
University Fellow, RFF

Singapore Energy Conference
November 4th 2008

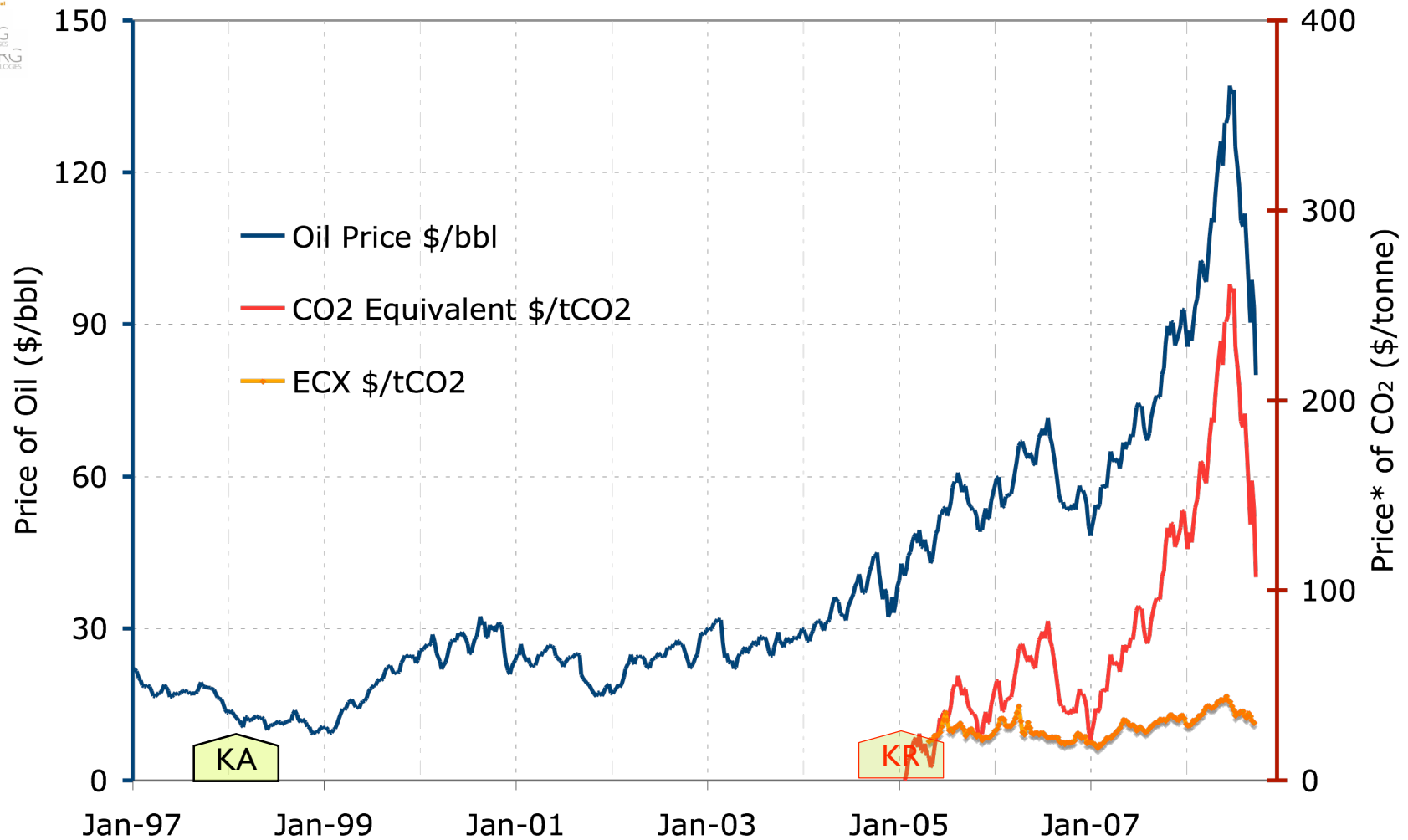


OVERVIEW

- *Context* cf. carbon markets
- Technology Availability and Evaluation
- Winning strategies



OIL PRICES, CO₂ PRICES





OPPORTUNITIES

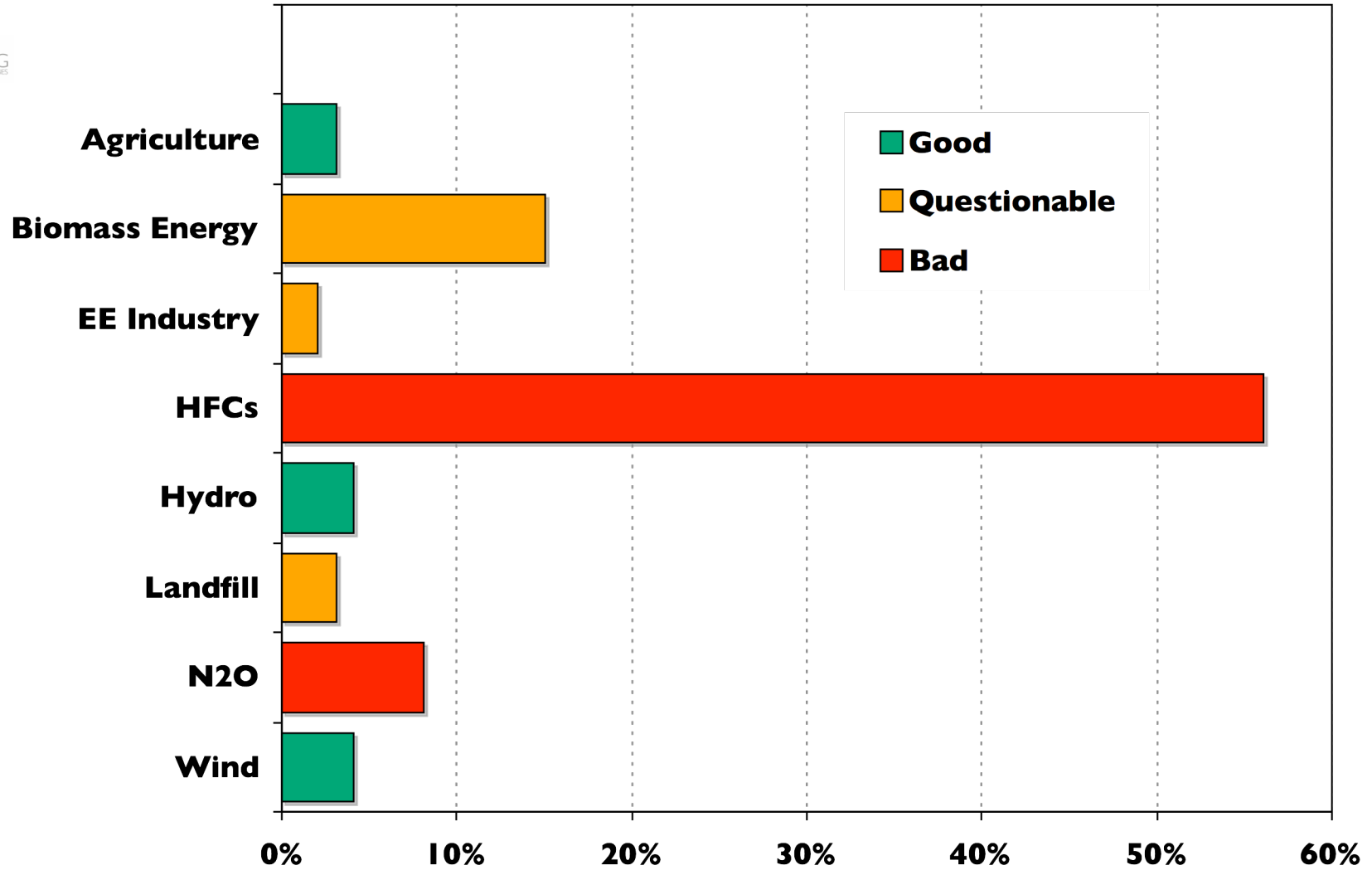
- CDM projects
 - Over \$400 B in business opportunities in 4 years.

- Putting one's house in order
 - More than \$4 T in energy expenditures / year.

- New opportunities - *there is lots of room at the bottom!*
 - Efficient stoves, GSHP, Solar-cooling, LEDs, HIR, ...

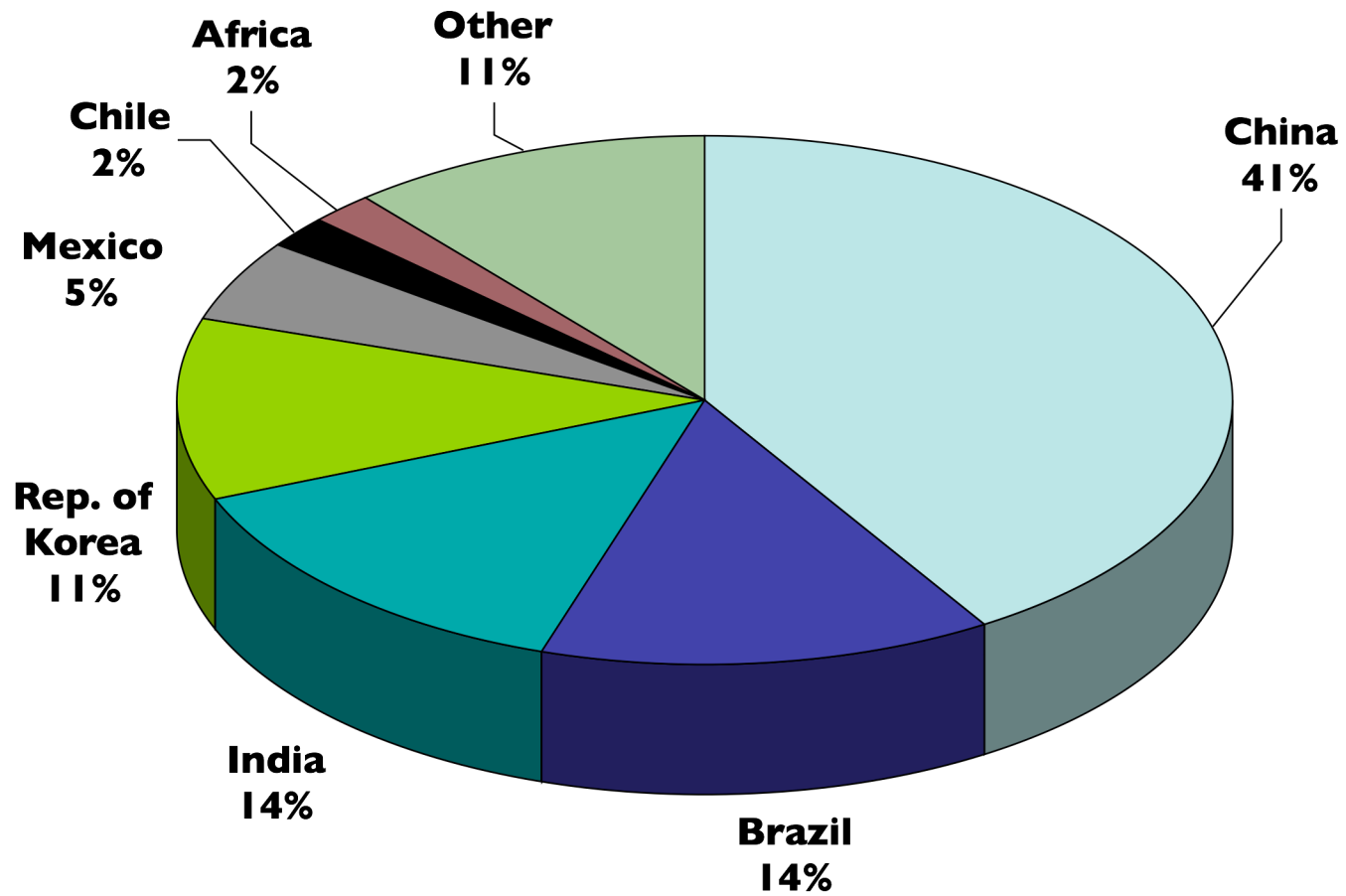


CDM PROJECTS





CDM DISTRIBUTION



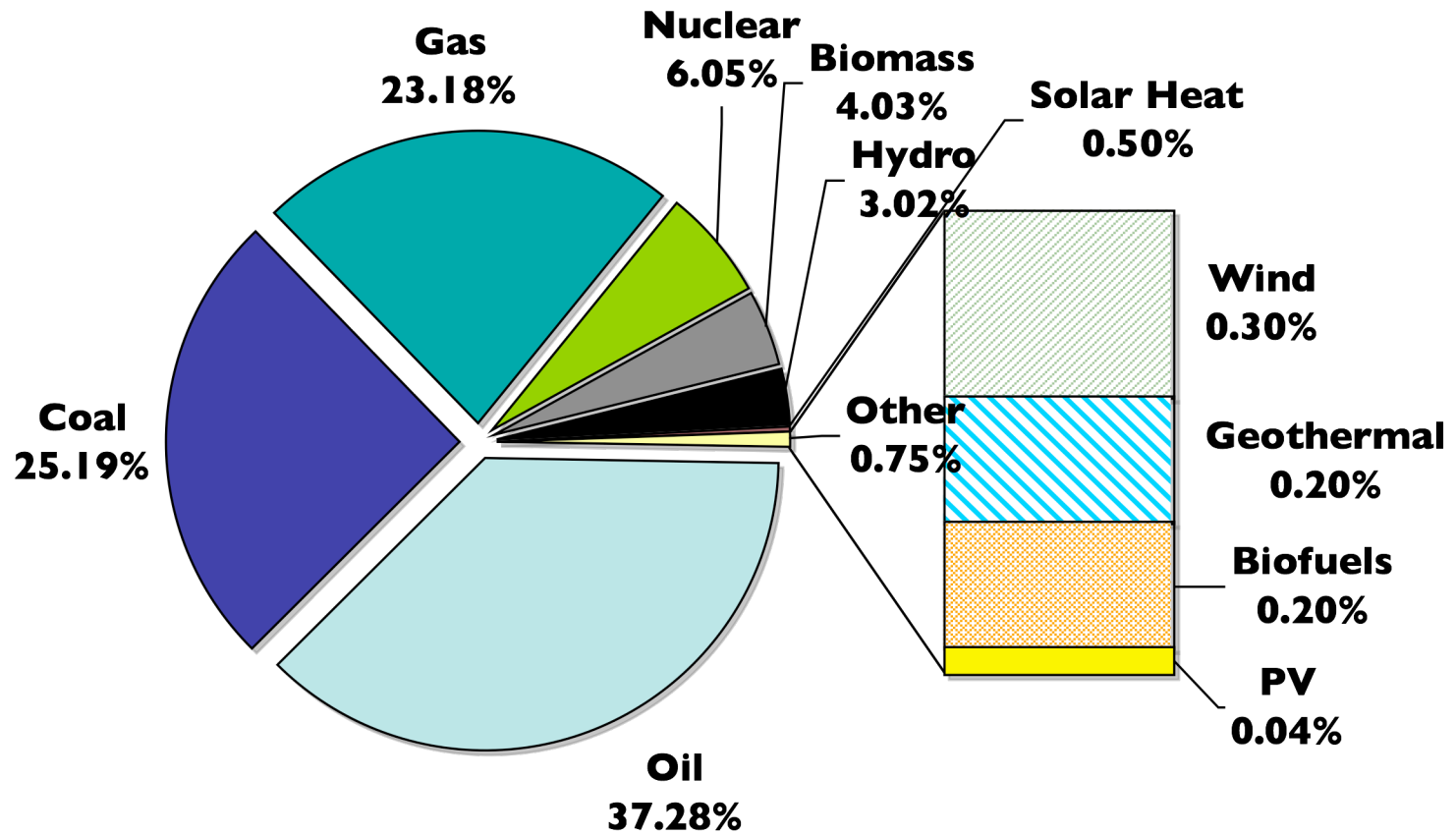


EFFICIENCY DRIVE

- Explicit management strategies seeking efficiency started with the first oil crisis in 1973
 - DOW Inc. have found opportunities for savings with payback of less than 2 years at their plants *for 35 years!*
- Six Sigma was introduced at Motorola in 1986 ...
 - Its principles can be used to improve manufacturing &/or reduce waste



THE ENERGY PICTURE





GREENER FOR SHOW?

PV electricity is ~50¢/kWh
But a 5kW system costs the same as a fancy new kitchen



There are long waiting lists for a Prius, but not a Camry Hybrid



NEW OPPORTUNITIES

Technology	Efficiency	Payback (\$75/bbl, 12%roi)	Notes
Poly-generation	100+%	~ 5 yrs	<i>More reliable service</i>
Solar cooling	200%	~ 5 yrs	<i>Most effective when most needed</i>
Hot in place repaving	200%	~ 5 yrs	<i>Better paving at 50% of the cost</i>
Turbo-expanders	n/a	~ 5 yrs	<i>Provides electricity where needed</i>
LED lighting	100+%	~ 7 yrs	<i>Units last 5x to 20x longer</i>
Heat pumps	250+%	~ 7 yrs	<i>Better payback at city block scale</i>

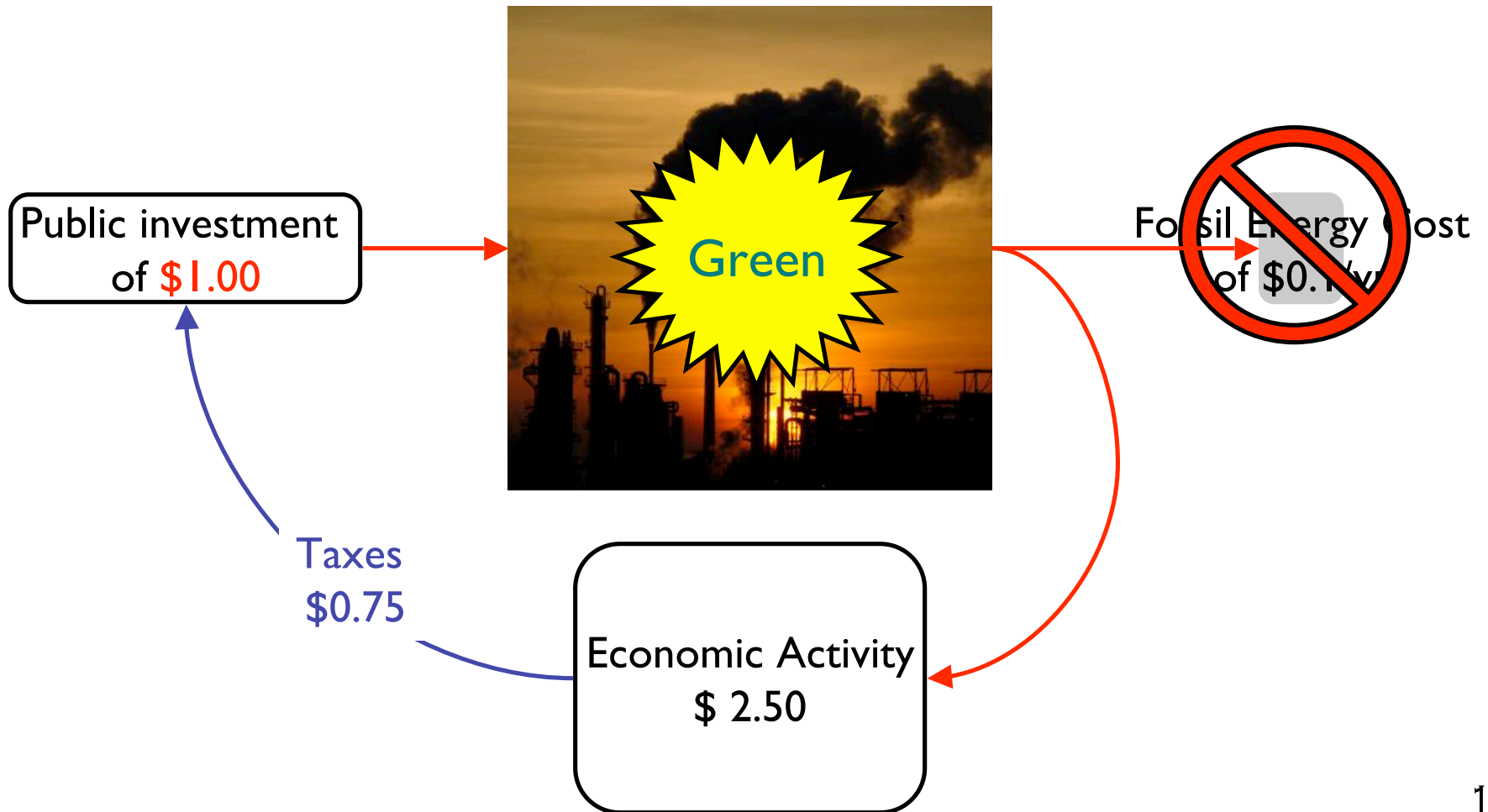


PERFORMANCE REGULATIONS

- The biggest hurdle facing new technologies is the simultaneous challenge of finding markets and securing credit.
 - Stretch goal performance standards guarantee a niche market for frontier green technologies.
- We need to test and demonstrate reliability and economy.
 - Initial clients can be the public sector, or seekers of the bleeding edge of technology.
- Once proven, the standard can be rolled out for the whole country



PUBLIC INVESTMENT





SUMMARY

- Context defines the risks and rewards
 - Factor prices usually dominate the “carbon incentive”
 - Regulations are key to market formation.
 - Client motivations vary, pick the right partners.
- Many proven technologies are available
 - Proven technologies provide more than 50% GHG reductions AND pay-back in less than 7 years.
 - Life-cycle assessments are critical to making sure there are true economic and GHG savings.
- Good management offers ongoing rewards.



THANK YOU

HADI.D@UBC.CA