



**ASPO**  
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# **Unlocking the Potentials of Renewable Energy**

**Aviel Verbruggen**  
**University of Antwerp**  
**[www.avielverbruggen.be](http://www.avielverbruggen.be)**

**Sources:**

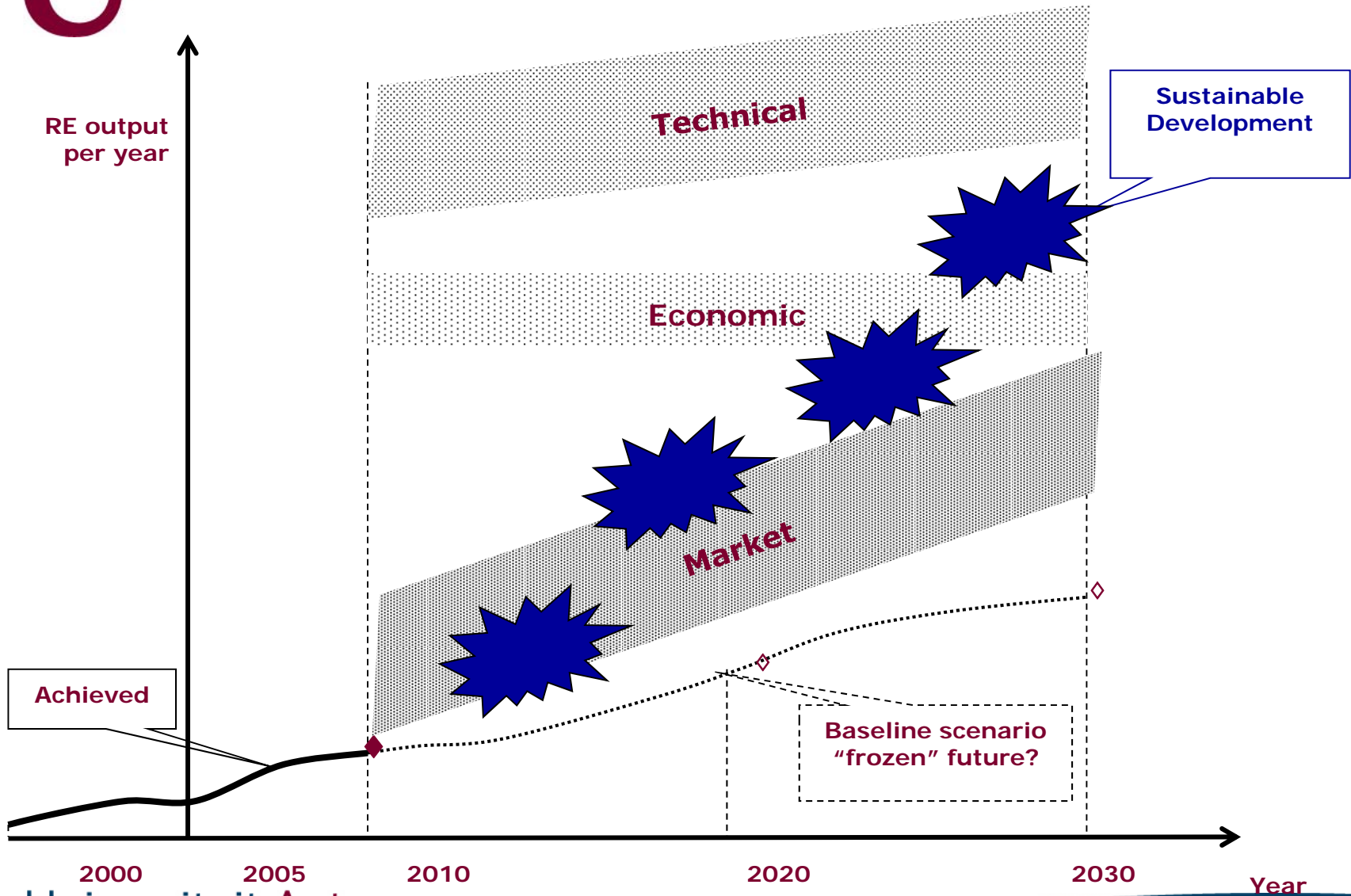
Verbruggen, A., et al., 2010. Renewable energy costs, potentials, barriers: Conceptual issues. *Energy Policy* 38, 850-861  
Verbruggen, A., Al Marchohi, M., 2010. Views on peak oil and its relation to climate policy. *Energy Policy* 38, 5572-5581  
Verbruggen, A., Volkmar, L., 2009. Basic concepts for designing renewable energy support aiming at a full-scale transition by 2050. *Energy Policy* 37, 5732-5743



# Overview

- **Potentials of Renewable Energy Supplies**  
**RE Supplies = Sources x Technologies**
- **Unlocking potentials**
- **Prices and their Role**
- **Conclusions**

# RE Supplies Potentials





# Market Potentials

- **Private economic agents realize**
  - **Expected private revenues & expenses**
  - *Large - small agents*
  - **Given, perceived, expected, conditions**
- **Markets are regulated by public authorities**
  - **Current approaches and instruments**
  - **E.g. levies, subsidies, ...**
- **Established contexts / no disruptive changes**
  - **Gradual adaptations**
  - **Partial pricing of externalities**

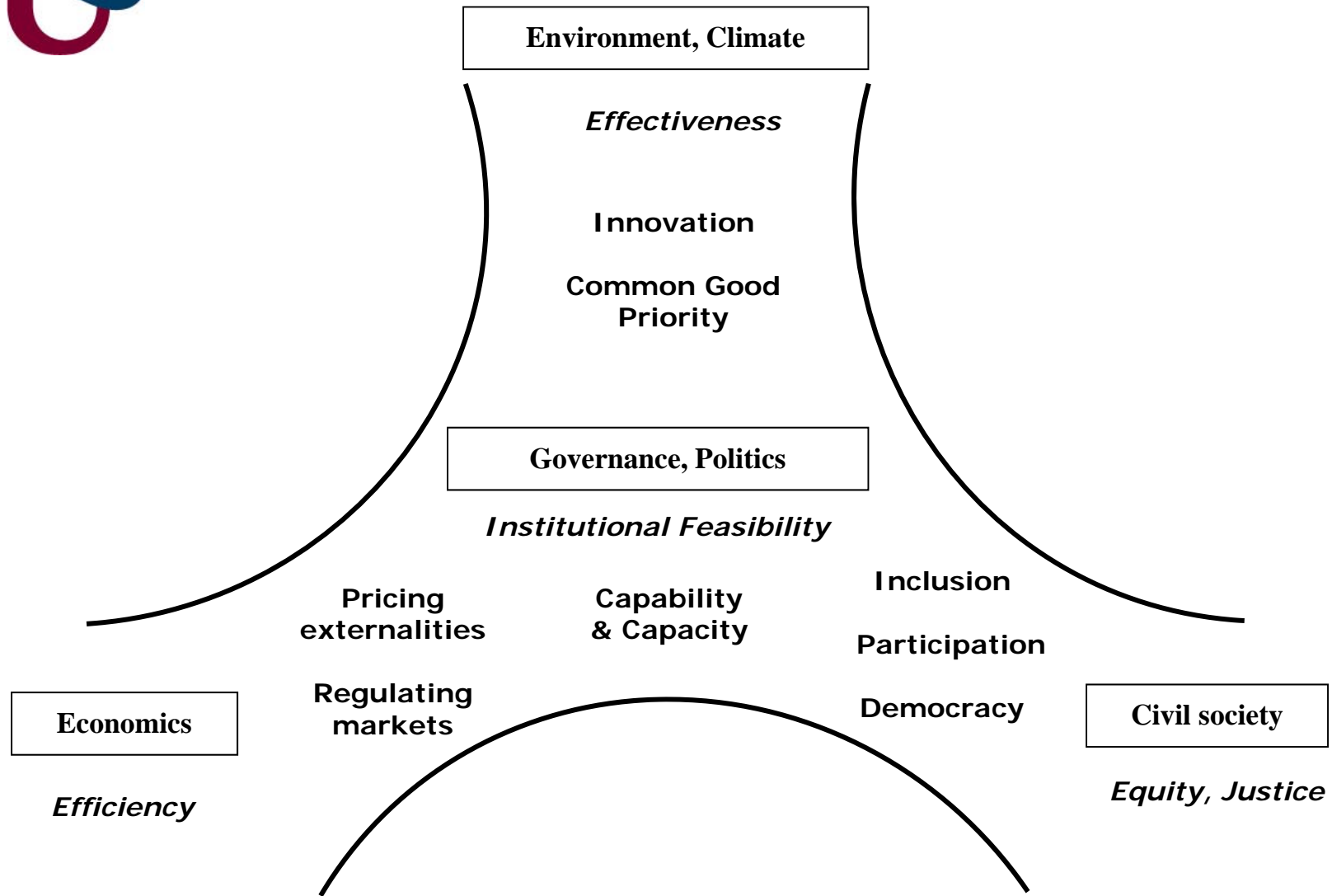


# Economic Potentials: stronger regulation

- **Full Pricing *private & public* factors**
  - **Negative external costs**
  - **Co-benefits**
- **Social discount rates (below private ones)**
  - **More focus on future generations**
  - **Active policies needed to bridge gap between public aspirations and private willingness-to-act**
- **Established contexts challenged**
  - **Changes remain non-disruptive**



# Sustainable development as the interaction of **four** dimensions



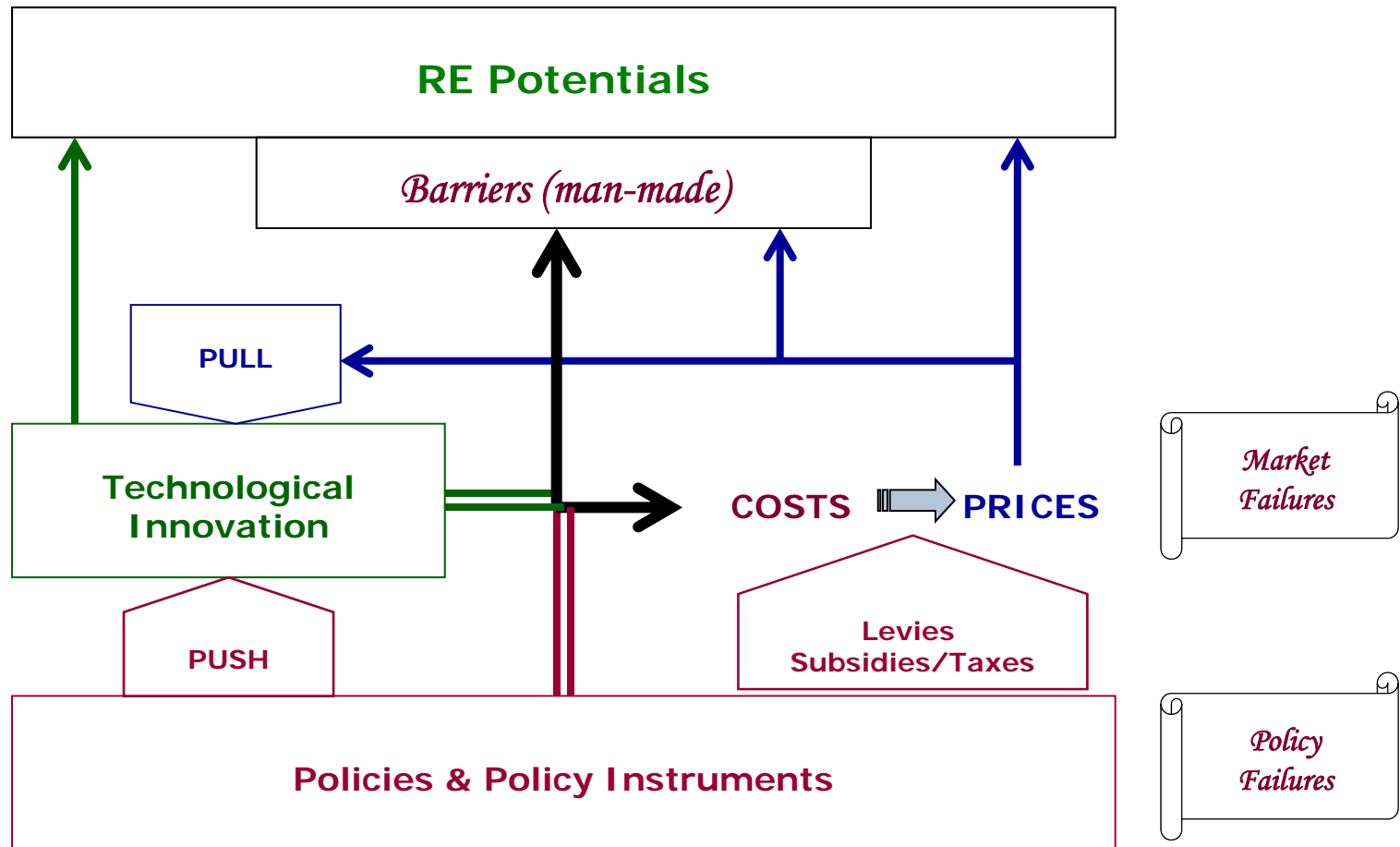


# Sustainable Development Potentials

- **Dimensions of SD (4 P's)**
  - **Planet, People, Prosperity**
  - **Policy: governance, institutions, regulations**
- **Social discount rates**
  - **Very low values: future as important as present**
- **Disruptive changes (WCED, 1987)**
  - **Controlling growth (populations; accumulation)**
  - **Redistribution of opportunities and wealth**
  - **Exploitation of resources**
  - **Direction of investments**
  - **Orientation of technological development**
  - **Institutions**

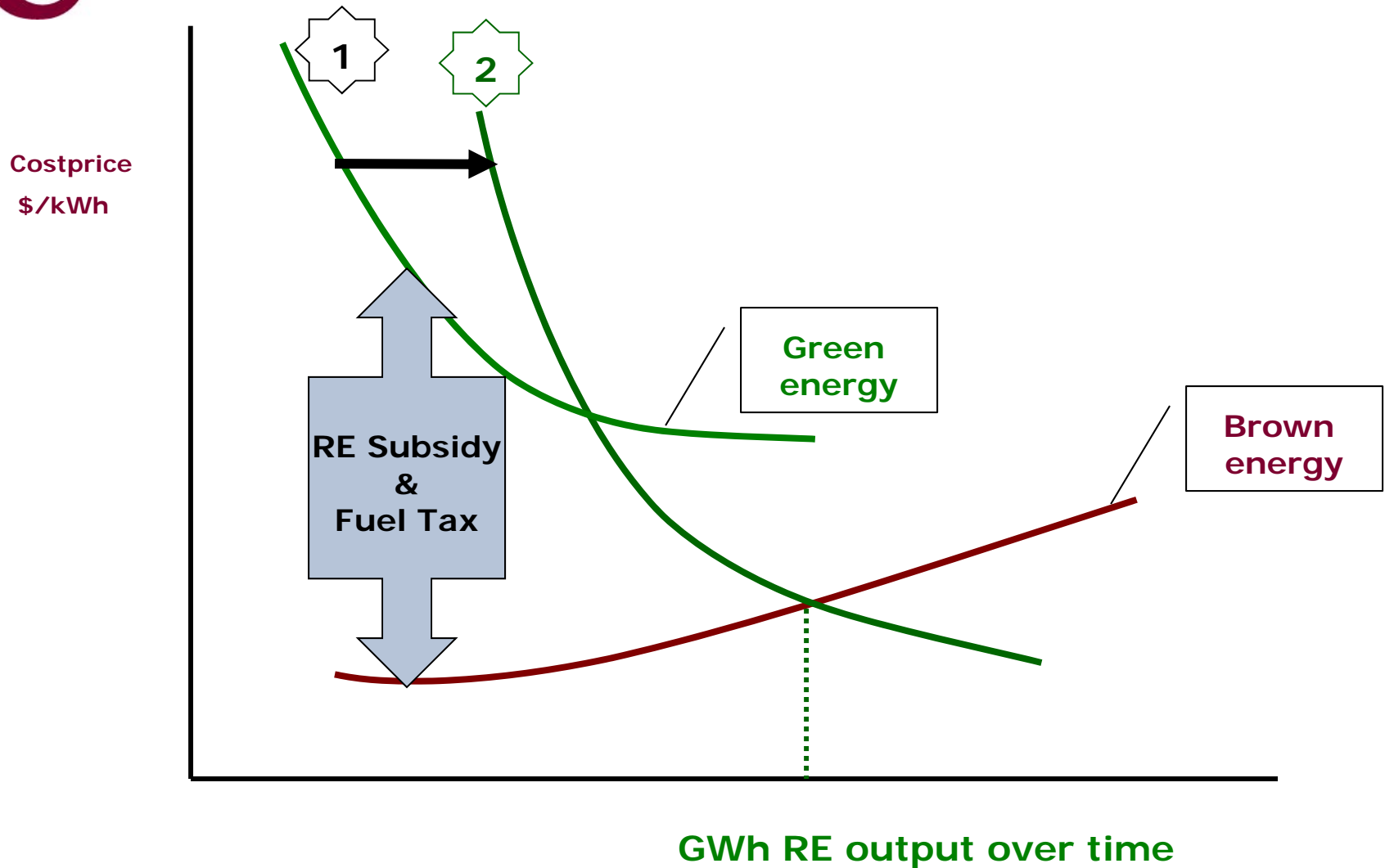


# Unlocking RE potentials





# Dynamic Effects: induced innovation by technology push& pull



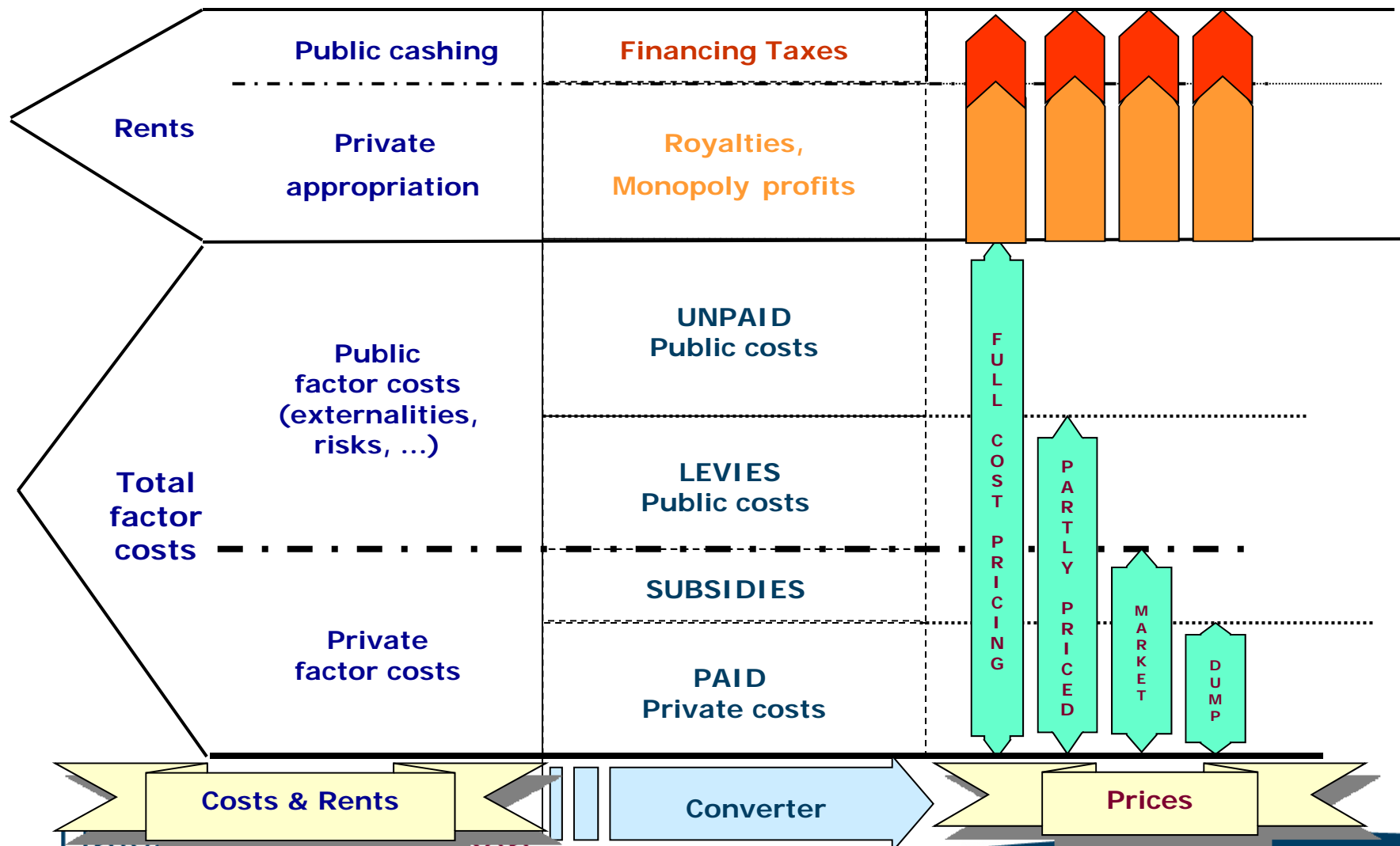


## The role of PRICES

- **Information signals**
  - People observe & understand prices
- **Incentive steering**
  - Prices steer people's decisions, behavior
  - However: "BILLS / BUDGETs" are the real drivers
- **Reality of energy prices**
  - Fossil fuels: cheap or low-priced?
  - Nuclear: risks and irreversible eternal impacts
  - Renewable energy: invest up-front
- **Who sets the prices & cashes?**
  - What does a price cover?
  - **Crucial role of governance**



# From Costs ...(+ Rents)...to...Prices







# Conclusions

## 1. RE Supplies Potentials

- Depend on policies & policy instruments
- Technically sufficient for full transition

## 2. Unlocking Potentials

- Technology + Pricing Policies do the job
- Peak-oil (if real): welcomed extra push

## 3. Prices show the way

**Not the unicorn carbon tax of economic myths**

**Fine-tuned pressures dosed by policy, in pace with carrying capacities of people & systems**