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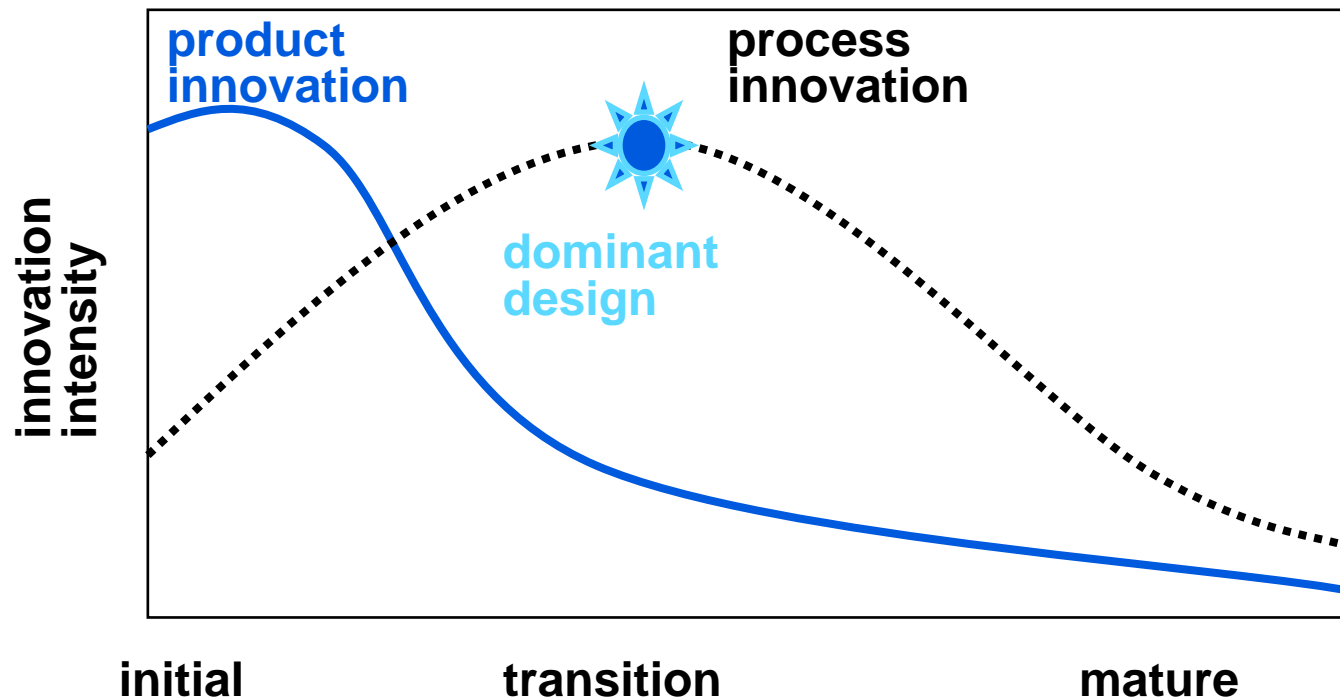
Dr. Peter Terwiesch, Chief Technology Officer, ABB Ltd

The Marcus Wallenberg Prize Symposium, 2009-09-29

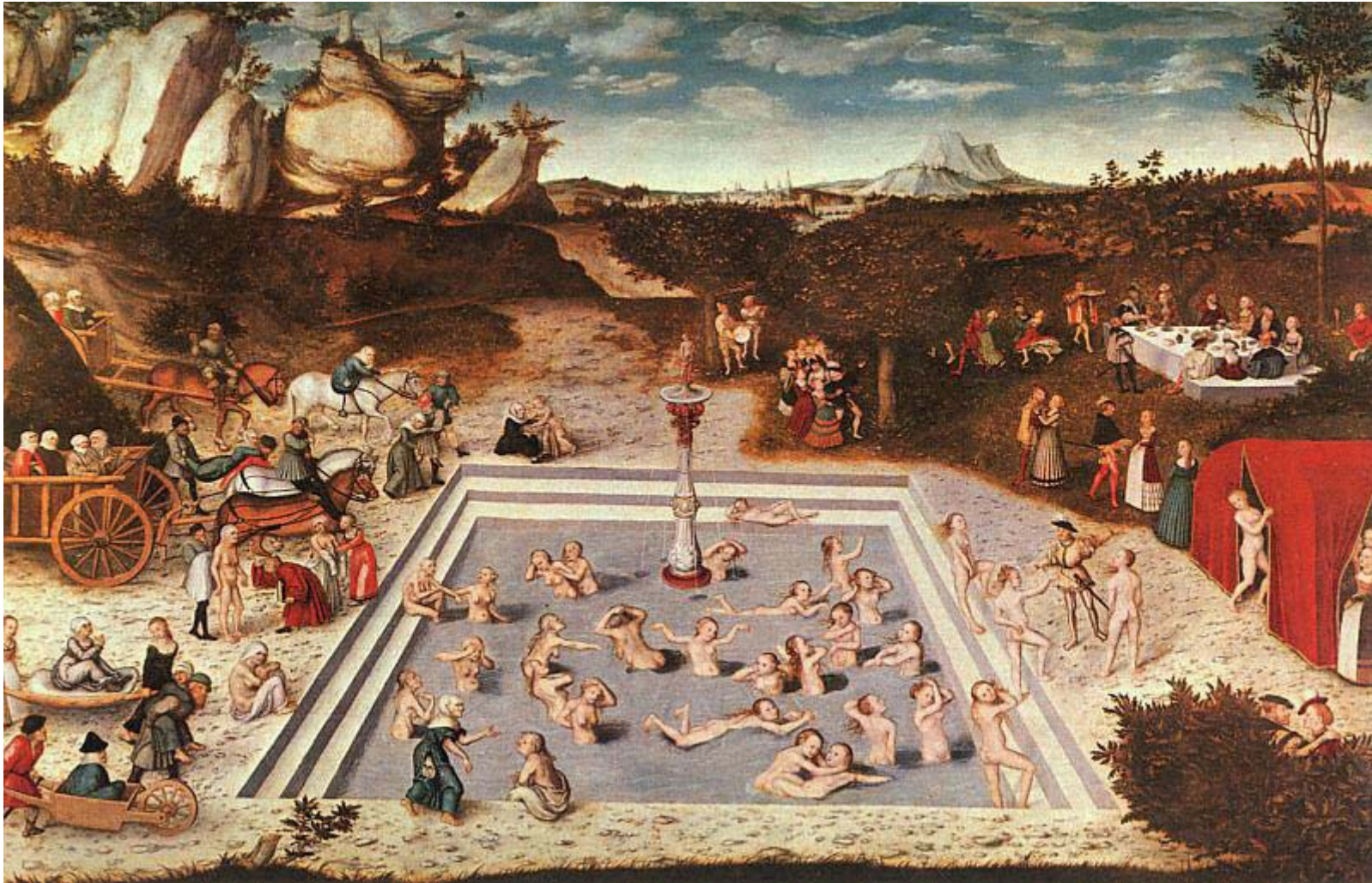
Can R&D be the Fountain of Youth in a mature industry?

Mature industry

- Following earlier periods of introduction and growth, markets stagnate as demand saturates
- Supply capacity exceeds demand and often erodes margins
- Innovation intensity declines, focus on process innovation



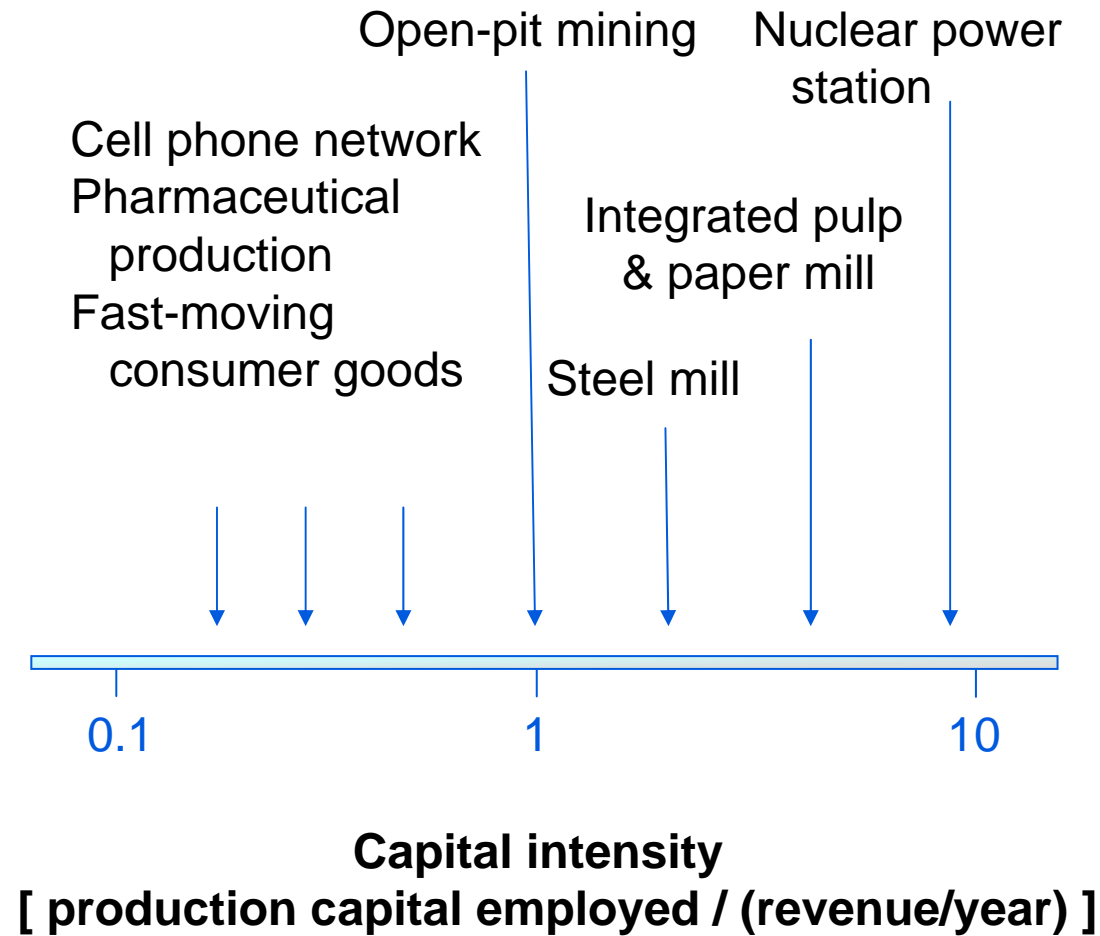
The Fountain of Youth



The Fountain of Youth, Lucas Cranach the Elder, 1546.

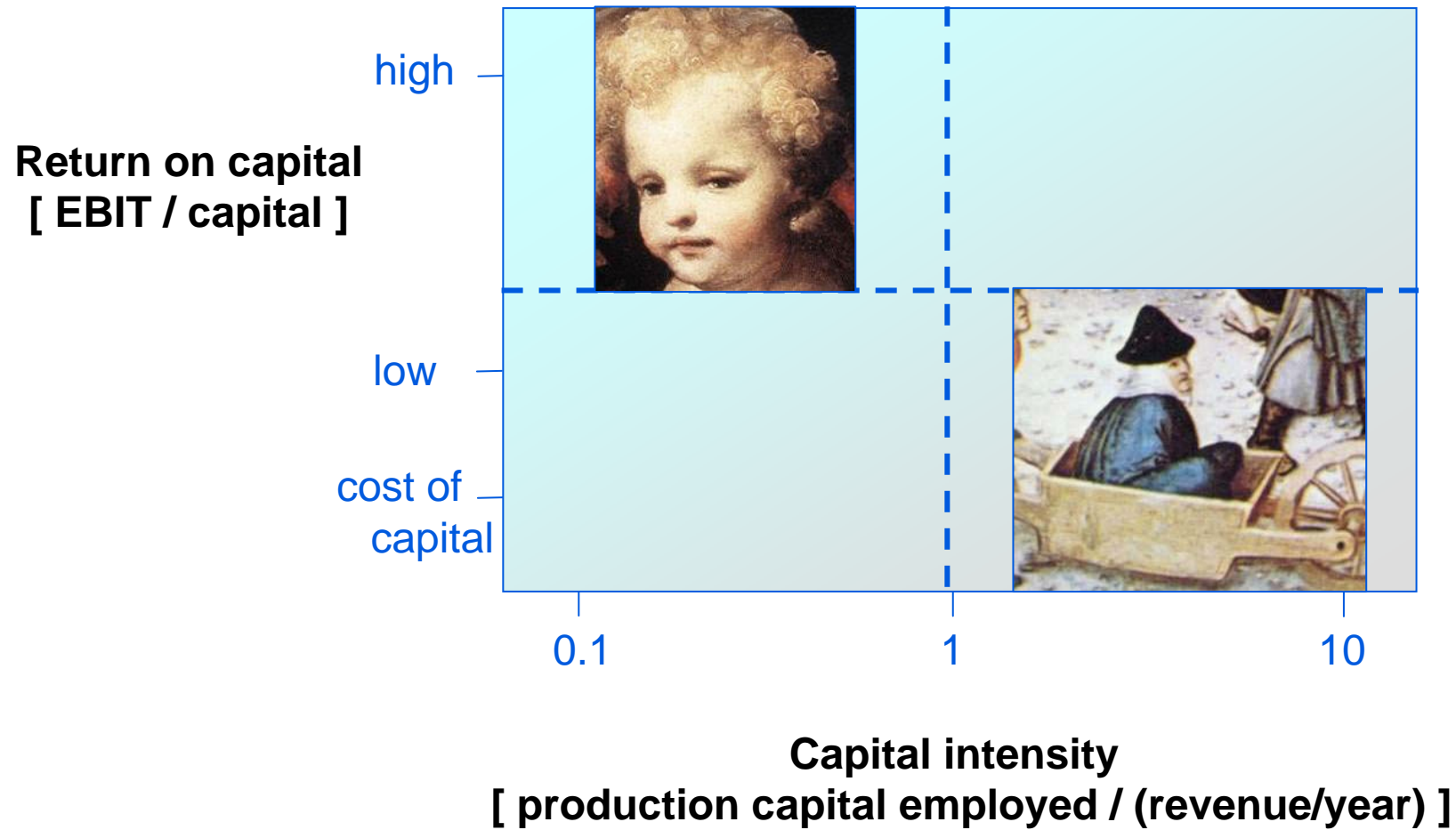
Capital intensity

Significant differences by industry



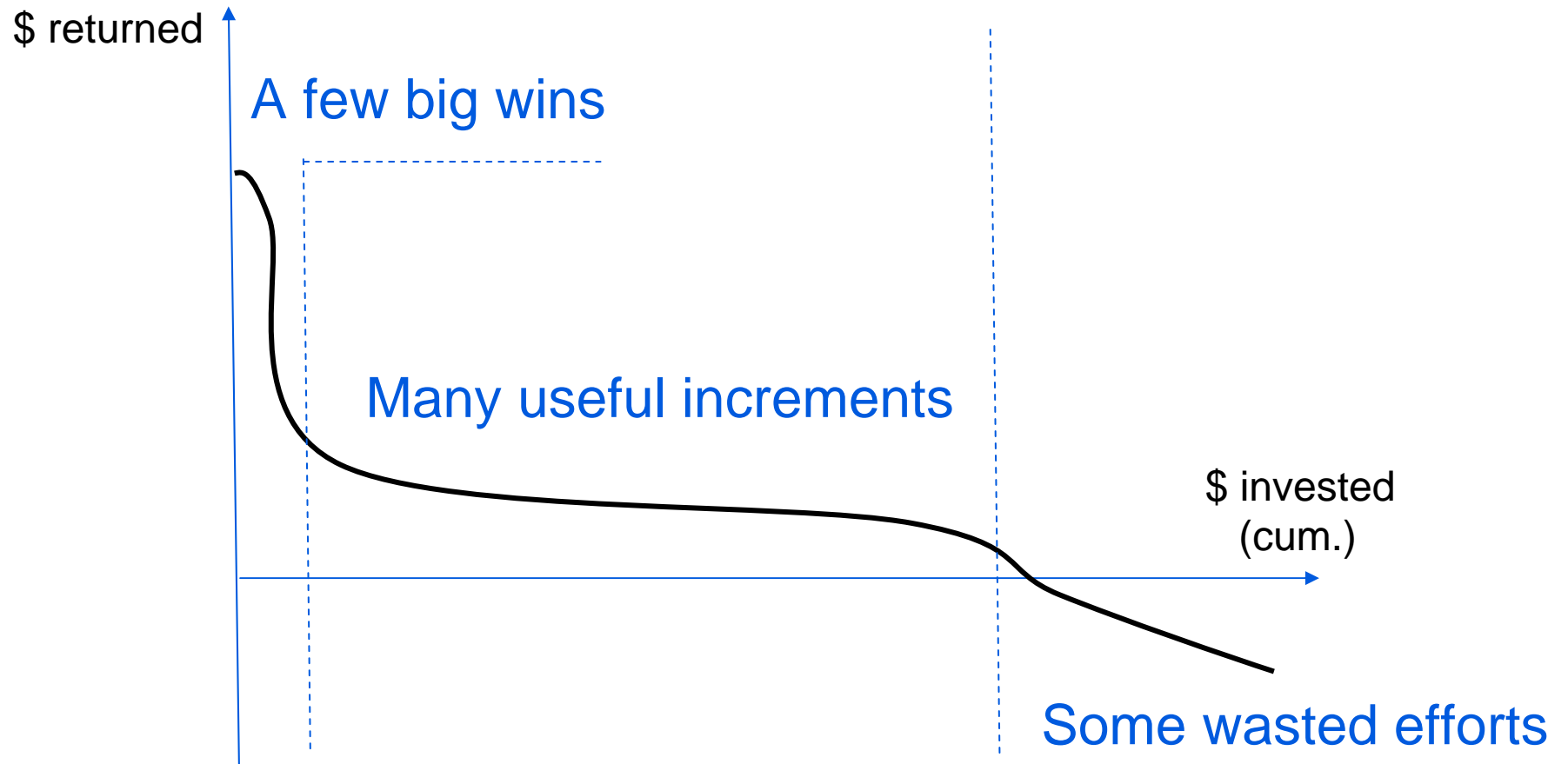
The Fountain of Youth

Industry characterization



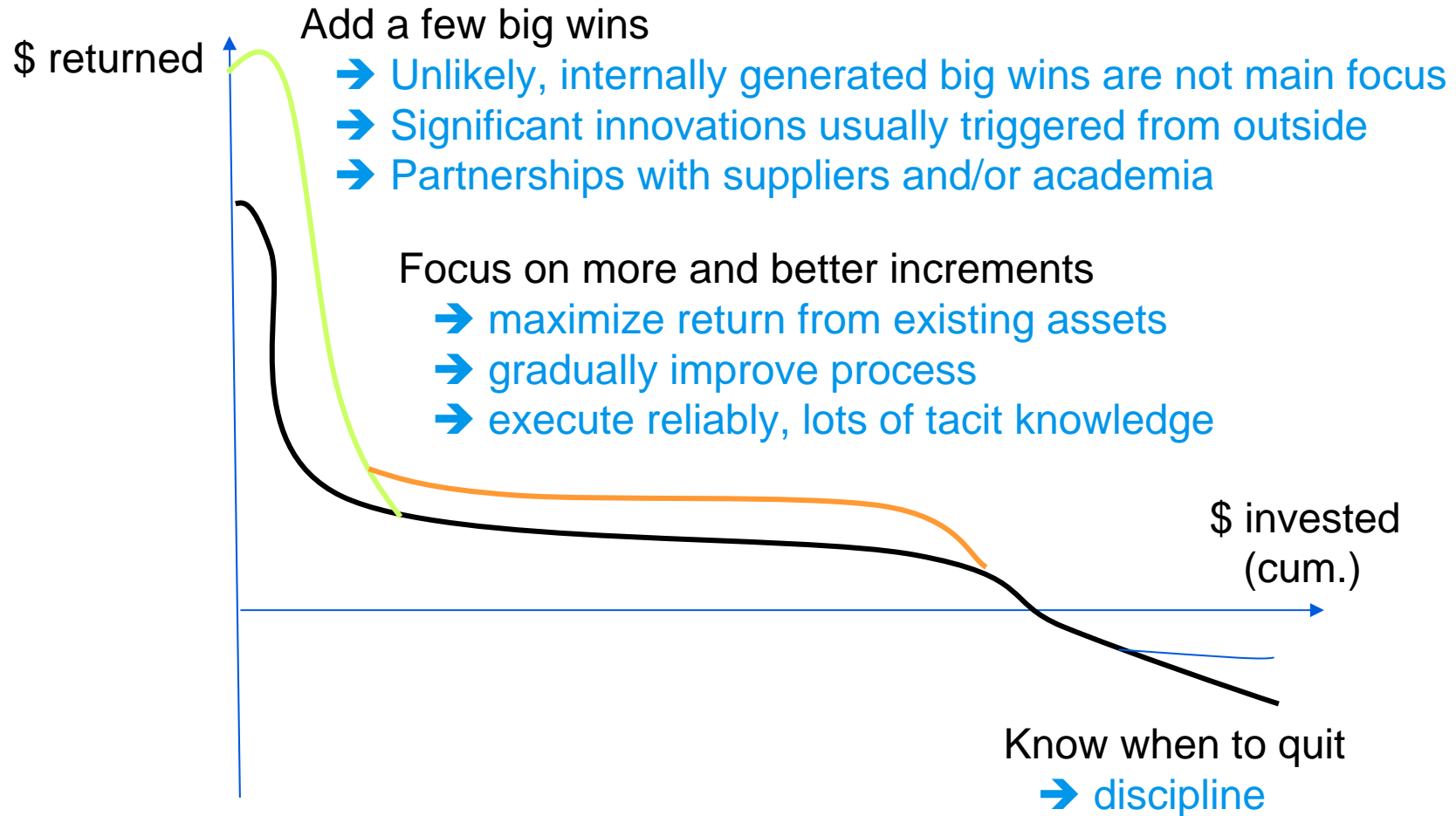
Driving the return of an R&D portfolio

Generic *a posteriori* R&D return curve



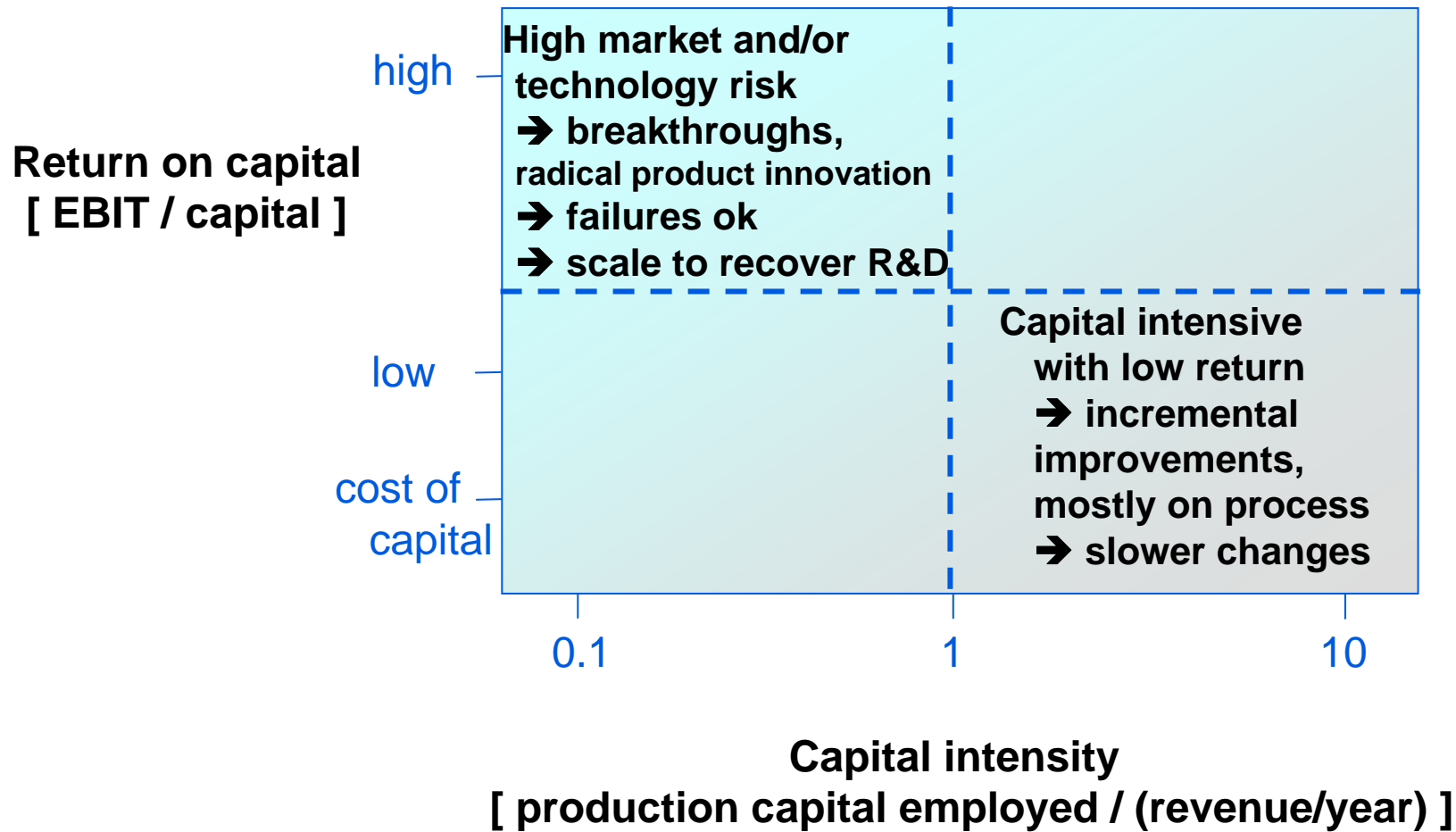
Driving the return of an R&D portfolio

Mature industry approach



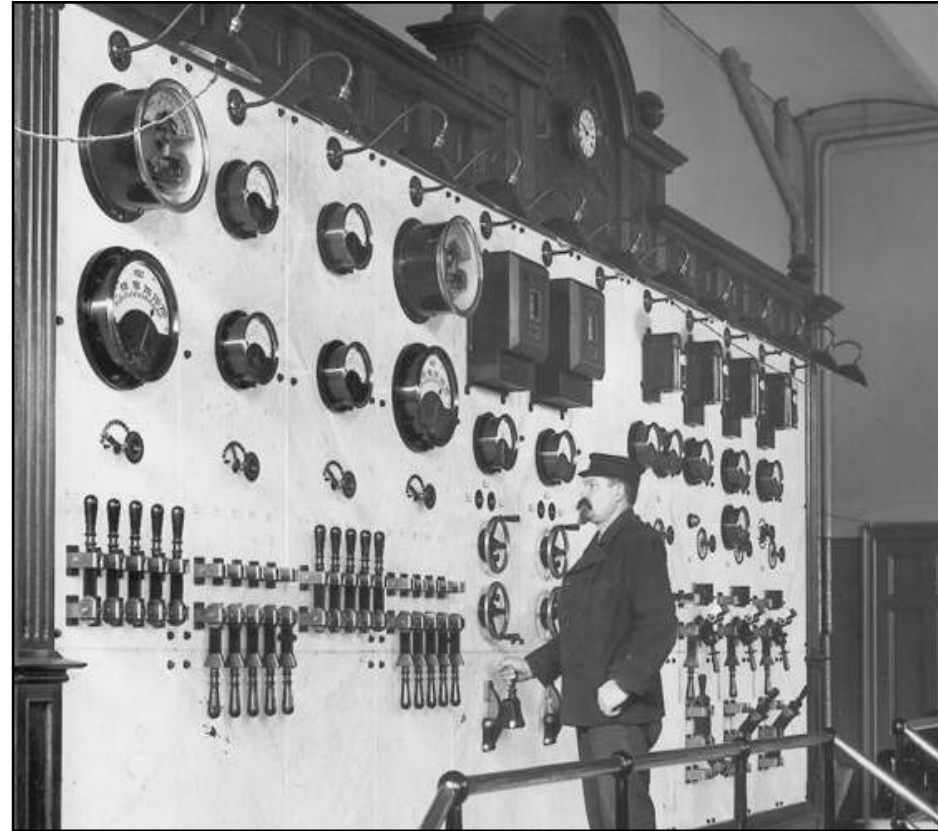
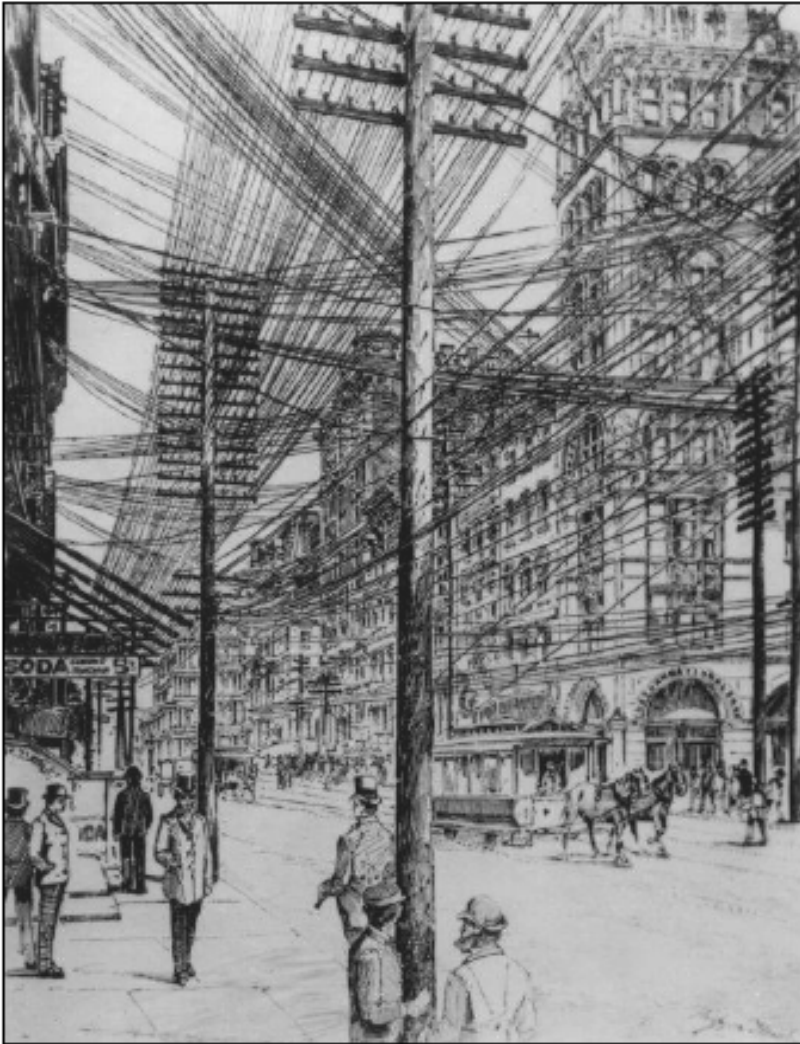
Implications for R&D

High-tech vs mature industry



Electricity around 1900

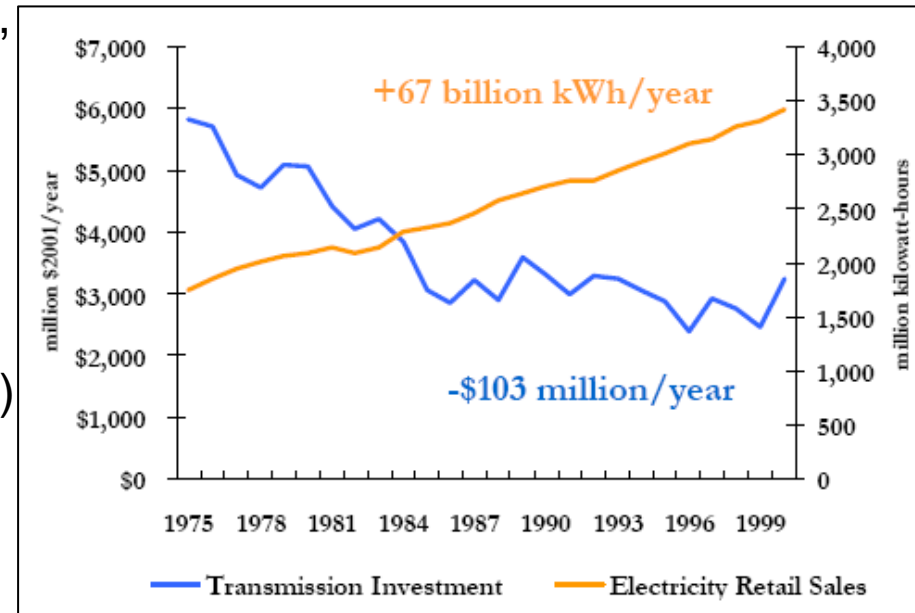
The days of the pioneers



Electricity around 2000

Mature and slow-moving

- At least in industrialized nations, investment in electricity infrastructure declined, while demand kept creeping up
- Average age of installed base continued to rise (e.g., US transformer >40 years)
- Major share of utility workforce due to retire within 5 years (US: >30%)
- Energy technology considered “uncool” by university students



Transmission investment and electricity retail sales
(US example)

Electricity today

Fundamental changes in power supply

Future challenges for electricity supply

- Increasing demand
- Environmental concerns
- Security of supply – less sourcing from sensitive regions

More renewable power generation

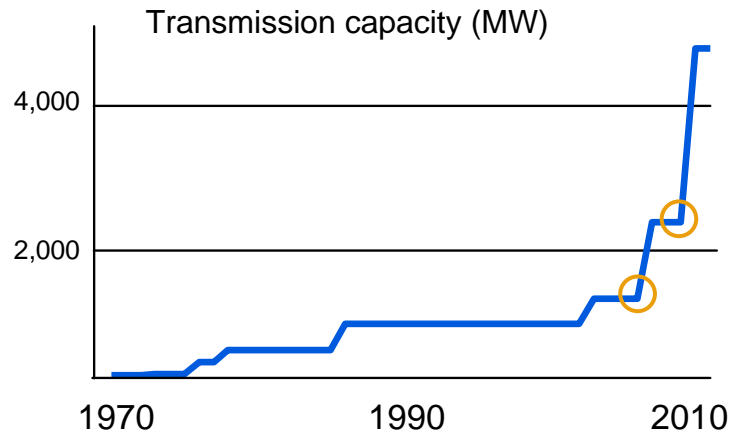
Energy efficiency

Reliability of supply

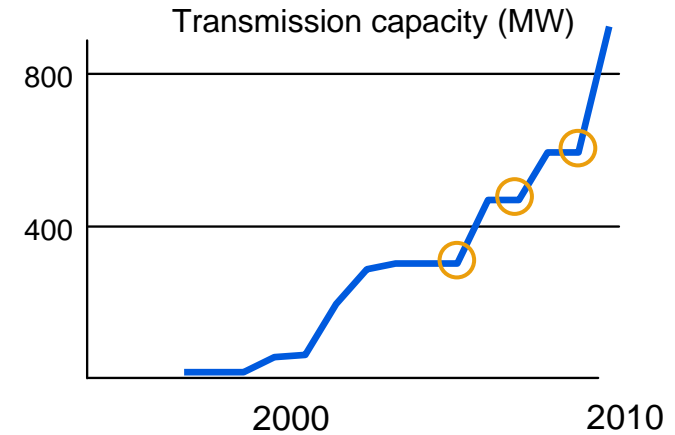
- Ageing infrastructure
- Ageing workforce
- IT security

Example: DC Transmission

Significant technology acceleration



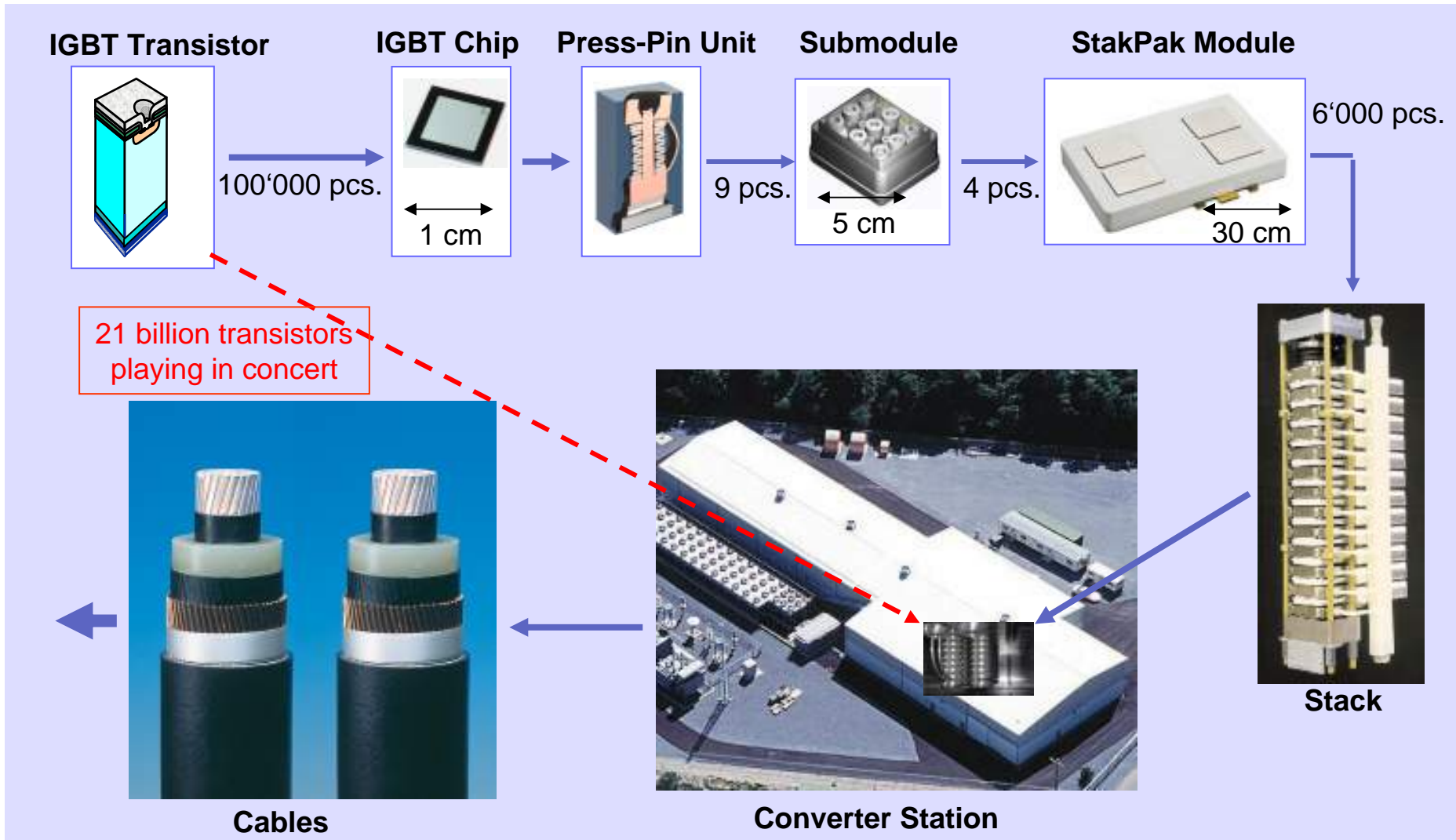
Technology leaps significantly increase transmission capacity



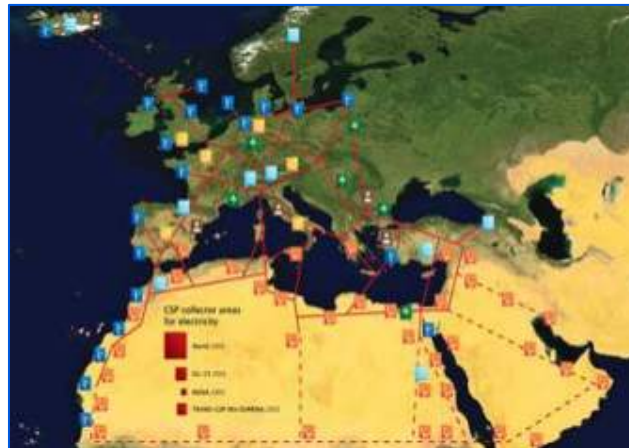
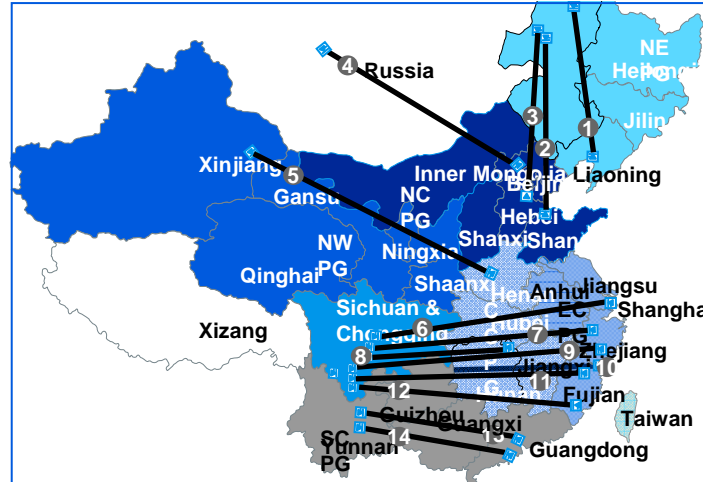
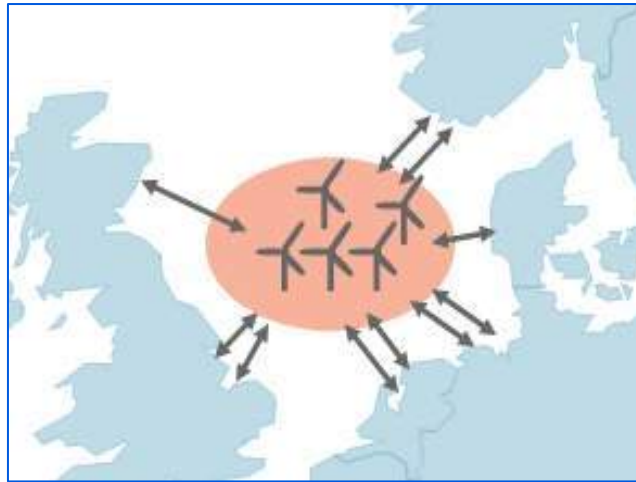
Power ↑ , Losses ↓

DC transmission

Stacking up: HVDC Light



DC transmission Towards a DC overlay grid?

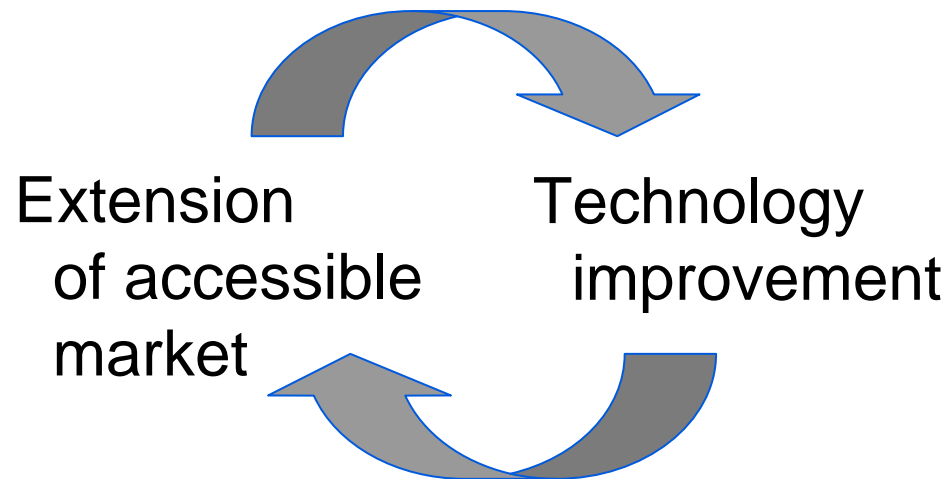


... ?

Sources: Statnet, energienet.dk, Svenska Kraftnet, Vattenfall, Airtricity, SGCC, desertec

With the benefit of hindsight Market + technology = “Fountain of Youth“

- A decade ago, we speculated something like this might happen – and even five years ago wondered whether it would
- Customer needs have changed significantly
- A mix of well-established and radically innovated technologies have risen to the challenge of meeting these needs



Can we navigate towards a Fountain of Youth?



Juan Ponce de León's expedition to find the fountain of youth in Florida (1513) failed, and many after him

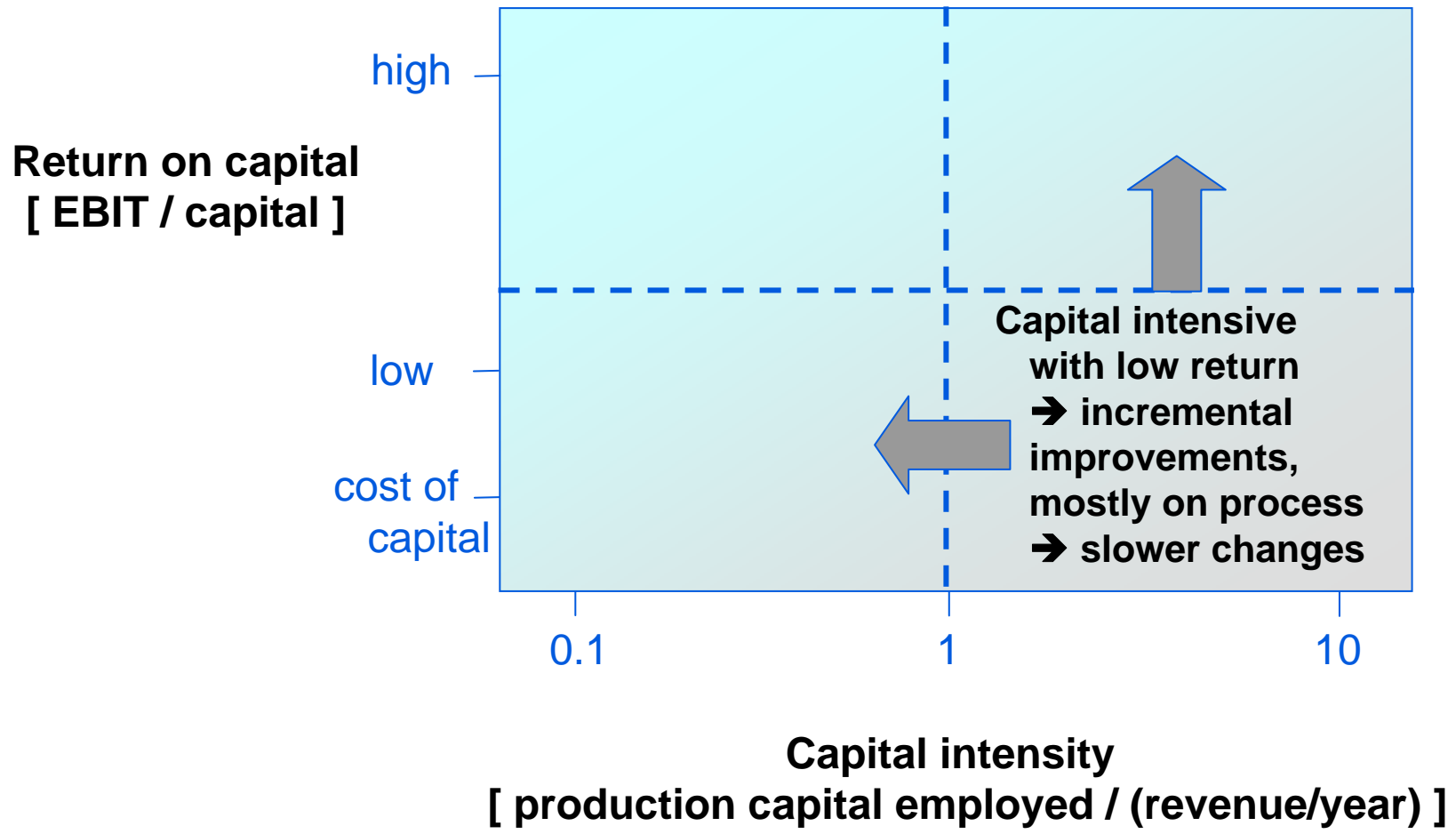
- We usually don't have a map, as we can neither perfectly predict nor control the combination of demand and technology
- ➔ Put main effort on staying fit, over-prioritizing search for Fountain of Youth at wrong time can be lethal in low-return industry



But:

- *“Discovery consists of seeing what everybody else has seen, and thinking what nobody else has thought.”*
(Albert von Szent-Györgyi)
- ➔ Recognize the signs when you see a path, manage change in people's habits when it happens, seize opportunity and pick the best partners

Incremental improvements are not a fountain of youth ... but still the way to stay healthy and fit



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