CIRCULAR ECONOMY CONFERENCE
Trondheim, 30-31 May 2018

Innovation in the Performance Economy

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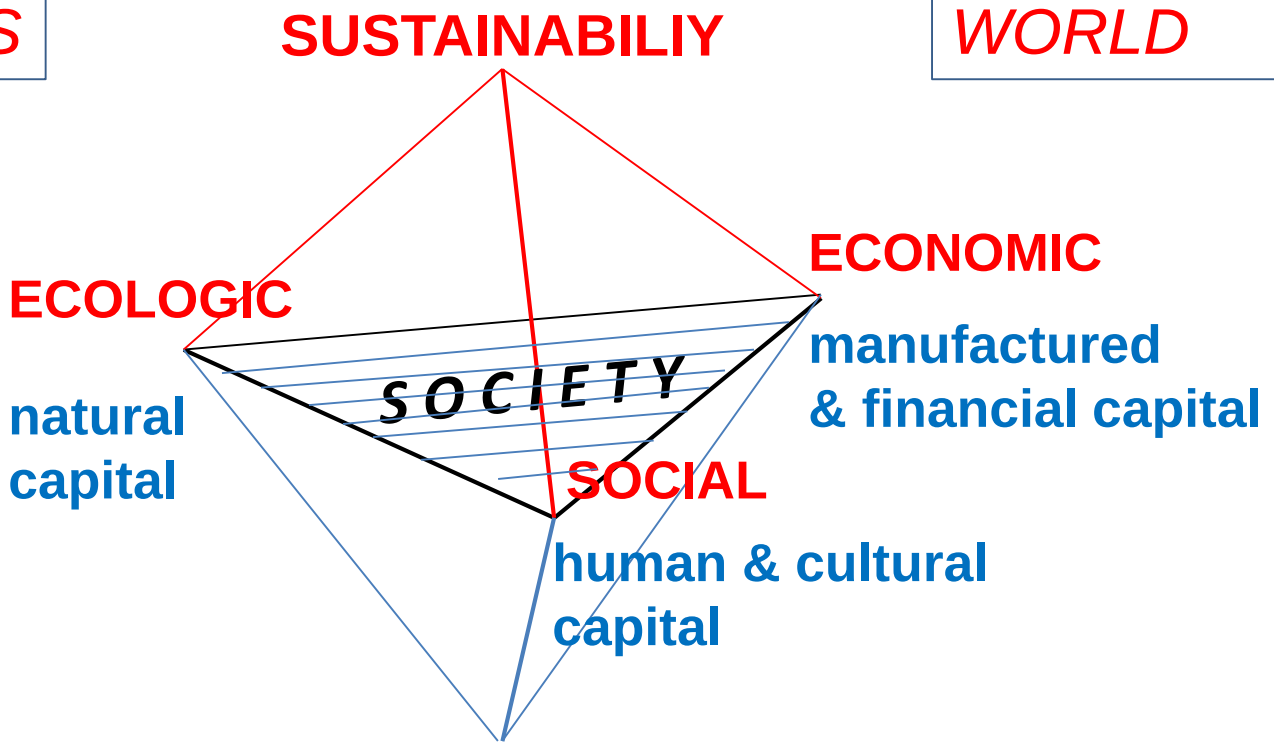
OBJECTIF: *HAPPINESS*

QUALITATIVE *WORLD*



OBJECTIF: *MANAGING CAPITALS*

CIRCULAR INDUSTRIAL ECONOMY

PHYSICAL *WORLD*

SITUATING SOCIETY, SUSTAINABILITY AND A CIRCULAR INDUSTRIAL ECONOMY

Three economic options – their values, drivers and risk limits

- **FLOWS** – the **Linear Industrial Economy** (LIE):
  - value added;
  - driven by emotion, fashion and tech progress;
  - ends at the Point of Sale.
- **STOCKS** - the **Circular Industrial Economy (**CIE)
  - use value maintained (Q&Q of stock):
  - driven by social, environmental innovation;
  - starts at the Point of Sale.
- Pay per **USE** - **the Performance Economy** (PE):
  - guaranteed results; - driven by competitiveness;
  - points of service replace the point of sale.

h*ttp://product-life.org/en/3ecos*

The drivers of the CIE:
the **use value** of **objects,** and **trust**, e.g.

Probably the most reused objects world-wide

bank notes, dirty, contaminated with bacteria and drugs, old-fashioned

but guaranteed by National Banks or CEB

a driver so far ignored by politics:

societal benefits of a circular economy

in comparison to the present economy (12 countries) **Sweden**

macro-economic I/O *Study* *by Skanberg-Wijkman 2016.*

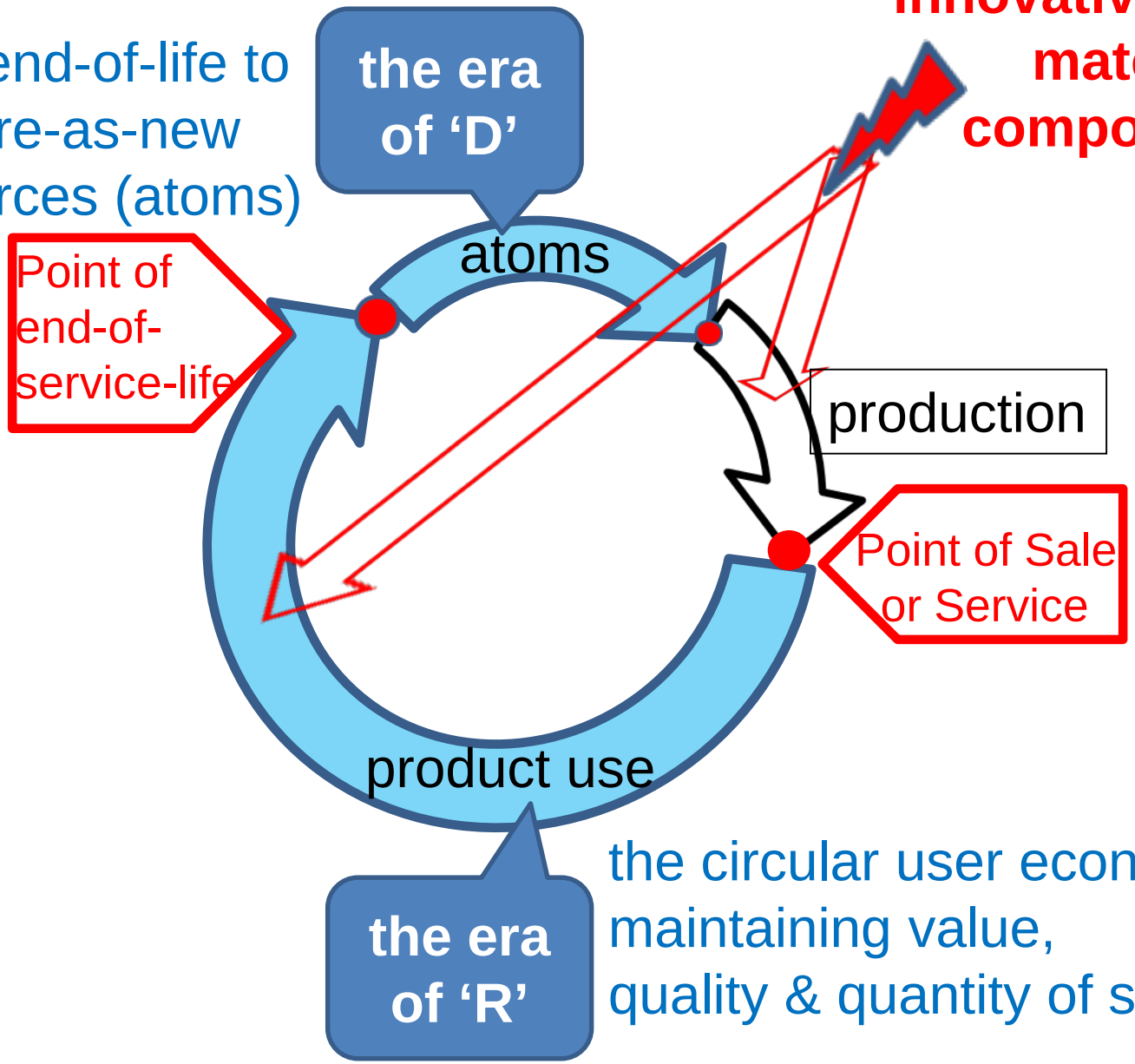
	circular scenario	energy efficiency	material efficiency	combined scenario
GHG	**— 50,1%**	**— 28%**	**— 5%**	**— 66%**
additional **jobs**	**+ 100’000**	**+ 200’000**	**+>300’000**	**+ 4% +>500’000**
trade balance	**+ 0.4%** of GDP	**+ 0.4%** of GDP	**+ 0,2%** of GDP	**+ 0,25%** of GDP

In fact, CE is a substitution of manpower for energy

http://www.clubofrome.org/wp-content/uploads/2016/03/The-Circular-Economy-and-Benefits-for-Society.pdf

backcasting view from a mature CE

from end-of-life to as-pure-as-new resources (atoms)



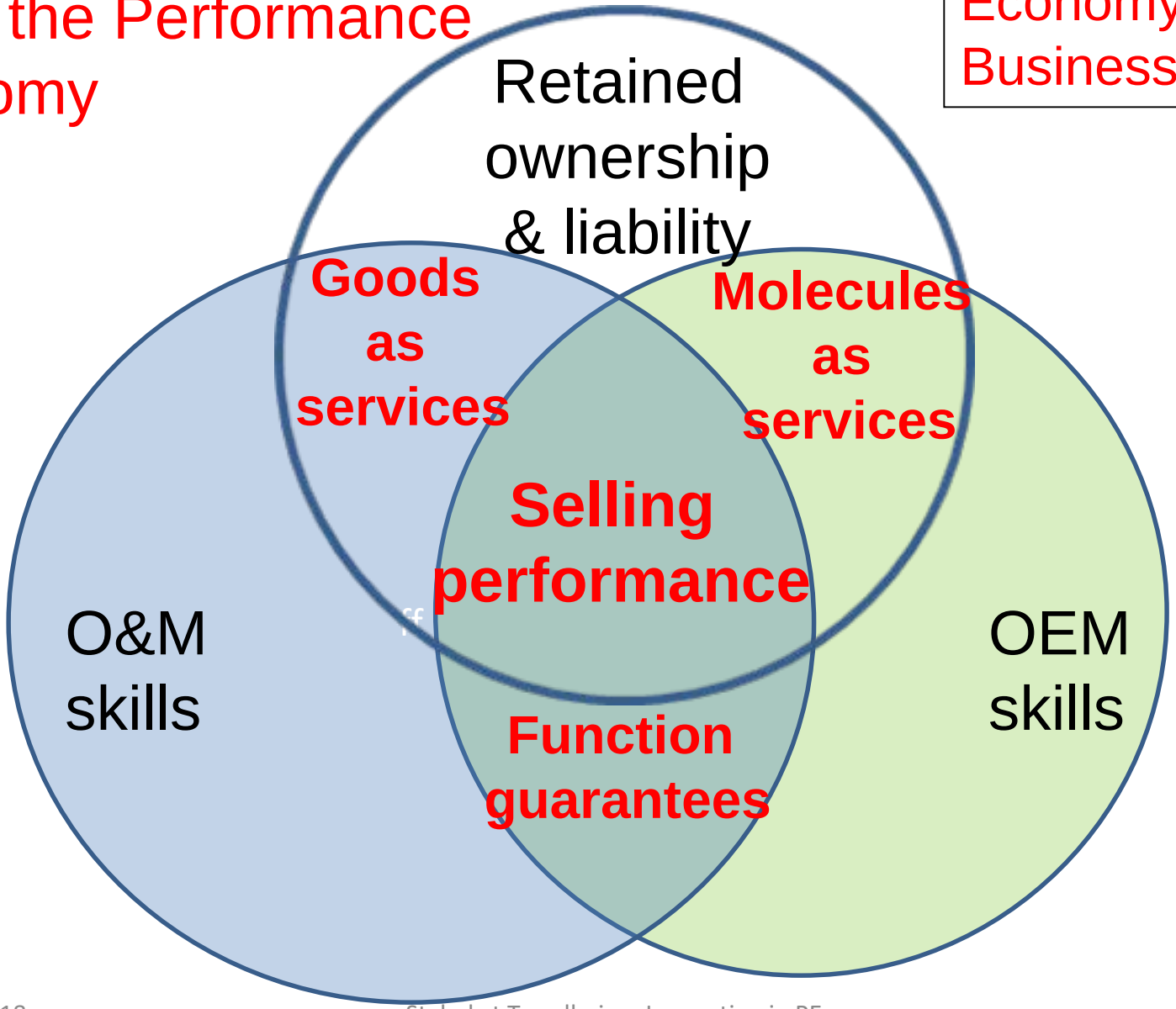
the circular user economy maintaining value, quality & quantity of stock

The Performance Economy:

a Circular Industrial Economy
where economic actors
retain **ownership** and
internalise all **liabilities**
and costs of risk and waste

Commercial quantum leaps boost the Performance Economy

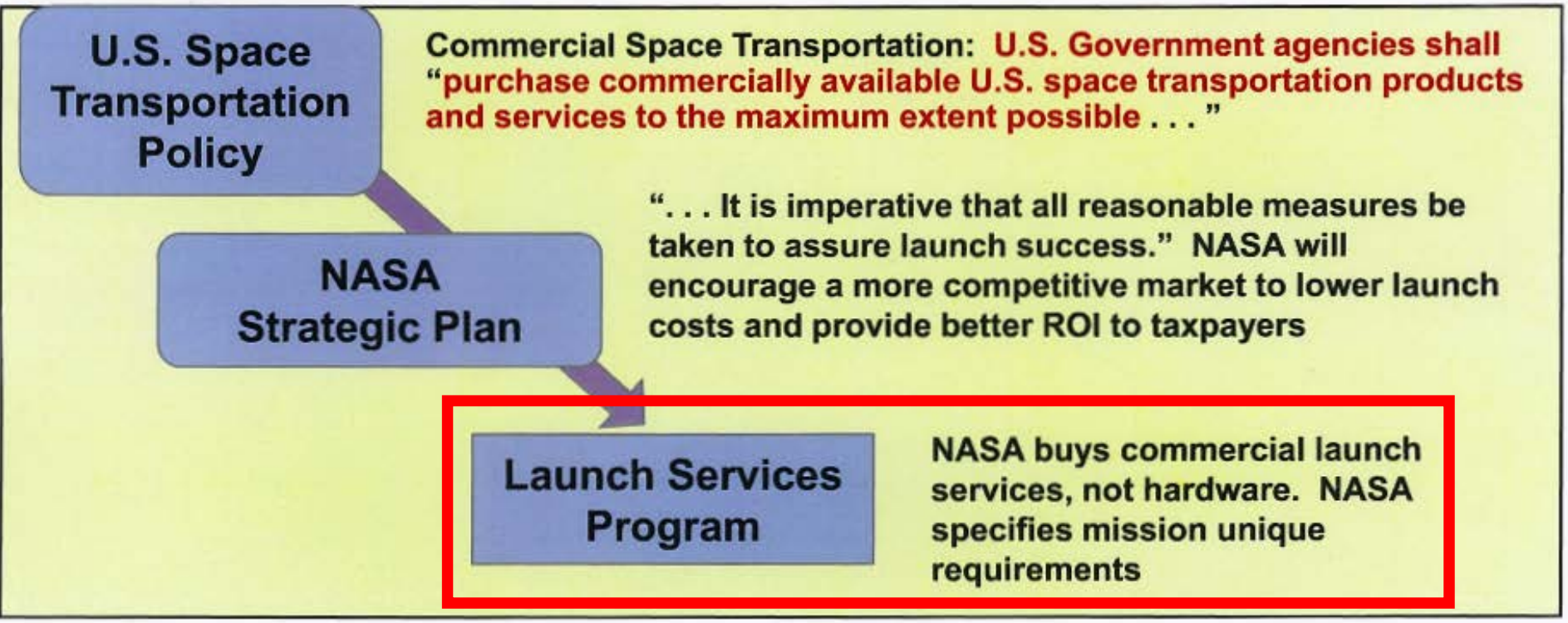
Performance Economy Business Models



1 Selling and Buying Performance instead of goods

Nations buying performance (goods as services)
NASA buys commercial launch services, not hardware, only specifying mission unique requirements (since 2005)

NASA Launch Services Program



Space X selling space transport services

reusable rocket Falcon

the World's most powerful rocket

propulsive rocket **landing**

Public procurement

Private Finance Initiatives (PFI): **infrastructure as a service**

a **78-year contract** to design, finance, build and operate **a toll bridge 2001 - 2079**, with a maintenance contract running until 2121

after a competition won by Effiage

Le pont de Millau, France


Goods as a service
functional
utilisation value
COSCO
COSCO
retained ownership

Goods as a service – economics-driven in-house reman by fleet managers

Savings 80 %

Remanufacturing of a passenger jumbo to cargo

	B747-400F Existing Cargo	B747-400SF Remanufactured Cargo
Max, Takeoff load	394 t	394 t
Max, Payload	117 t	115 t
Max, Range	8241 km	7593 km
Costs of purchase/remanufacturing	$150 million	$30 million
Number of parts		42000

Savings 80%

Source: Chosun Daily Newspaper, 2 May 2007

Corporate Reuse Creativity: old staff uniforms turned into bags for Eurostar

ICE 1 ReDesign

finance savings 87 %

In 1995, the 59 trains of German Rail had been in service for 15 years, covering 15 million km each.

- Redesign costs were **€ 3 million per train,** versus **€ 25 million** for a similar new train.
- Redesign **preserved** 80% of resources -- 16'500 tons of steel, 1180 tons of copper
  prevented 35'000 tons of CO_2 emissi
  500'000 tons of mining waste **per train**

enviro savings 80 %

The ReDesign included a technological upgrading of the rolling stock, and allowed to add more seats.

Driver: higher producer profits due to lower energy costs and long-life lamps

Philips' pay-per-lux

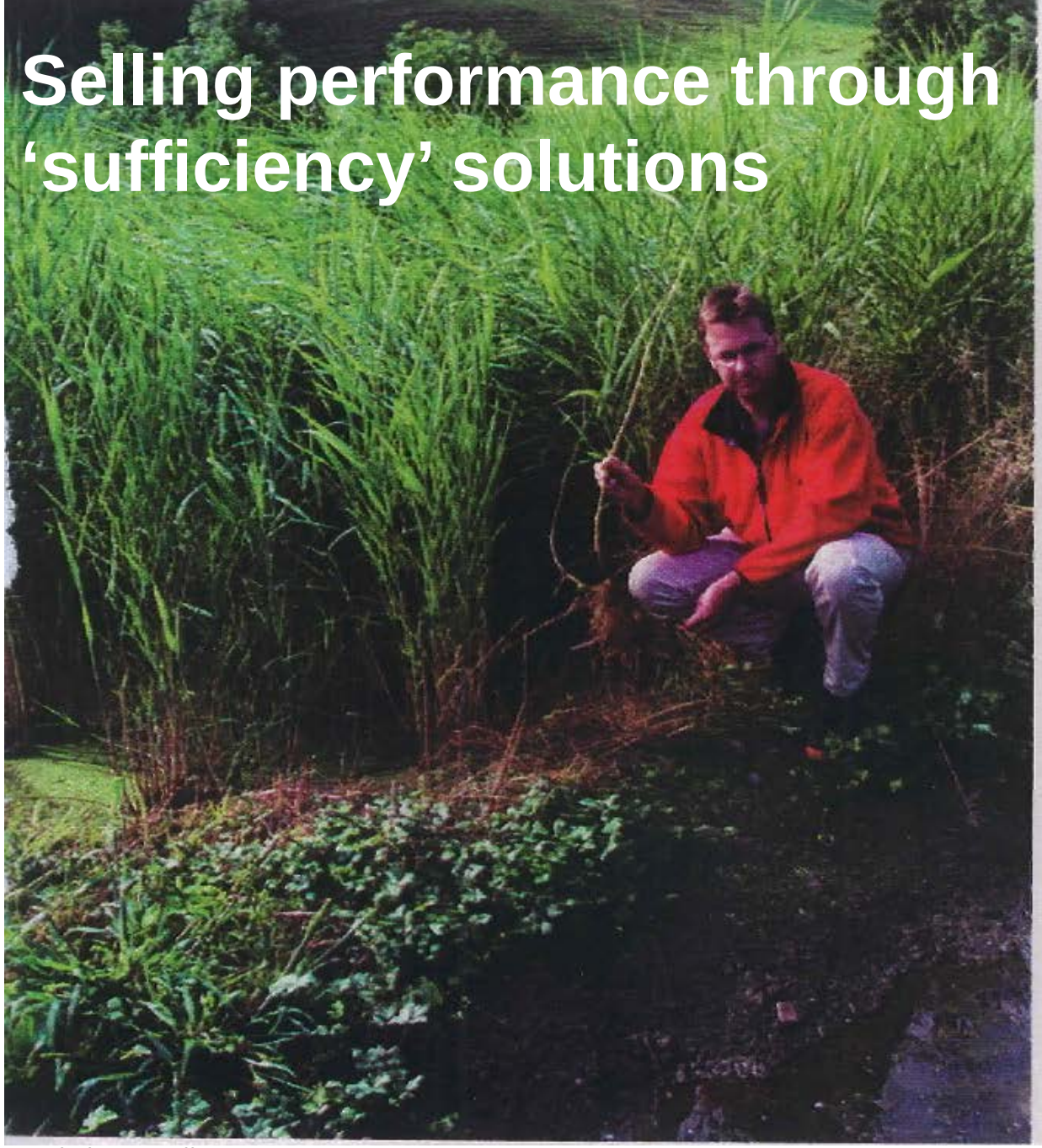
Rau architects' offices Amsterdam

Function over fashion and wishes:
as much light as needed where needed.
Higher profits achieved with higher efficiency.

Selling performance through ‘sufficiency’ solutions

appropriate for rural areas

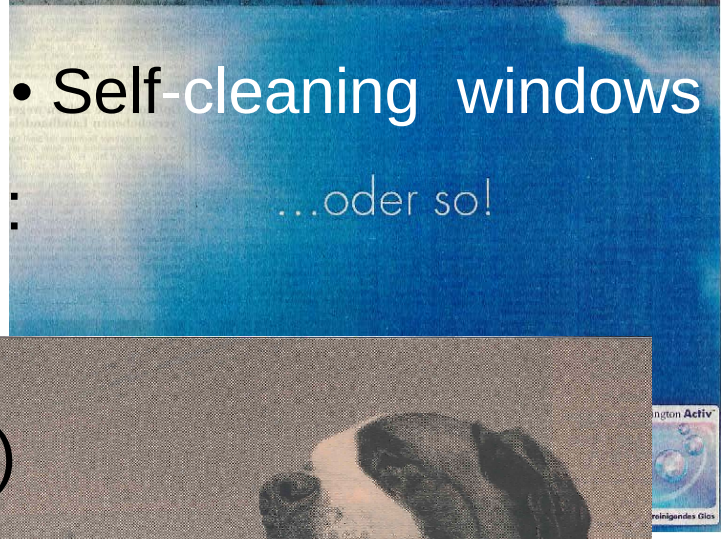
‘organic’ waste water treatment plants are low-cost (no ‘bricks’ or pumps), create biotopes and flood basins, have no sludge (waste) issue – but need space (4 m2/habitant).



Sufficiency - corporate driven:
more profits from less resources

- waterless urinals,
- plus-energy buildings,
- ploughing at night,
- accessibility instead of m obility
- was te-less packaging: mak e the bags from the same material as the contents (DuPont)

• Self-cleaning windows



redundancy and resilience

• herbicides-less vineyards (sheep) and tea plantations (goats)

2 Systems innovation in the PE

plus-energy buildings
design for the future

4 Times Square New York,
by Bob Fox, 1999

How to build them: facades - solar pv panel cabling

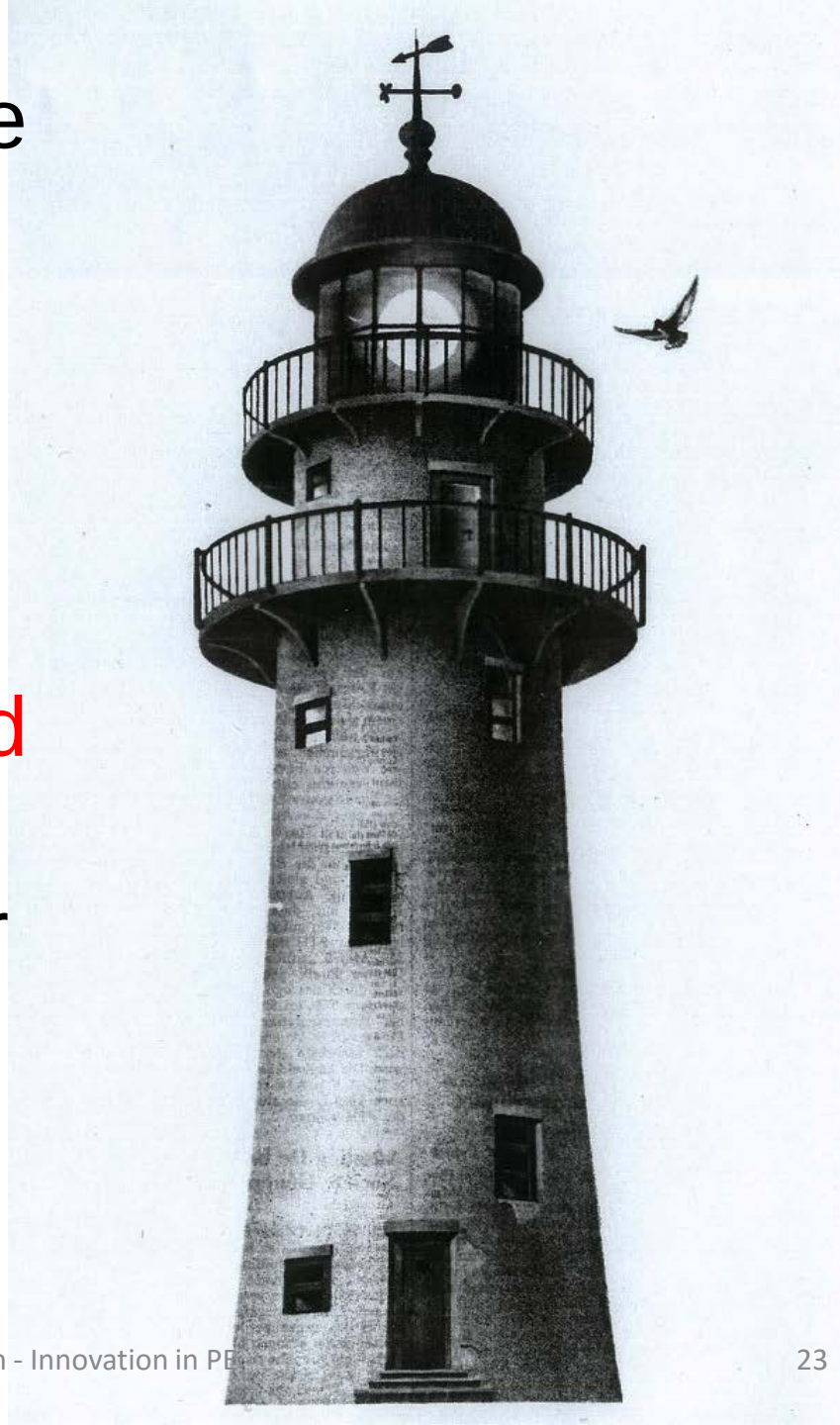
and their societal benefits:
in case of black-outs,
plus energy buildings take the strain off public services:
providing security through street lighting (no burglaries),
no blocked elevators,
no false alarms,

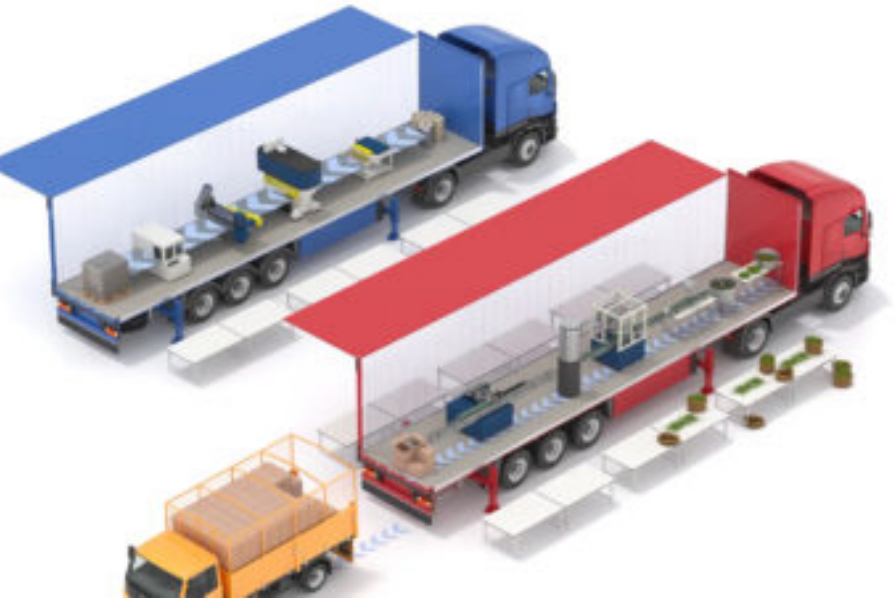
space for a giant fuel cell

ARUP’S circular building London 2016

Lighthouses have done more for the safety of shipping than any improvement to ships.

Systems solutions generate **low waste** and high **societal benefits** through intensive use or ‘eternal life’.
w**hose business,**
who bears the cost?





Tata Steel

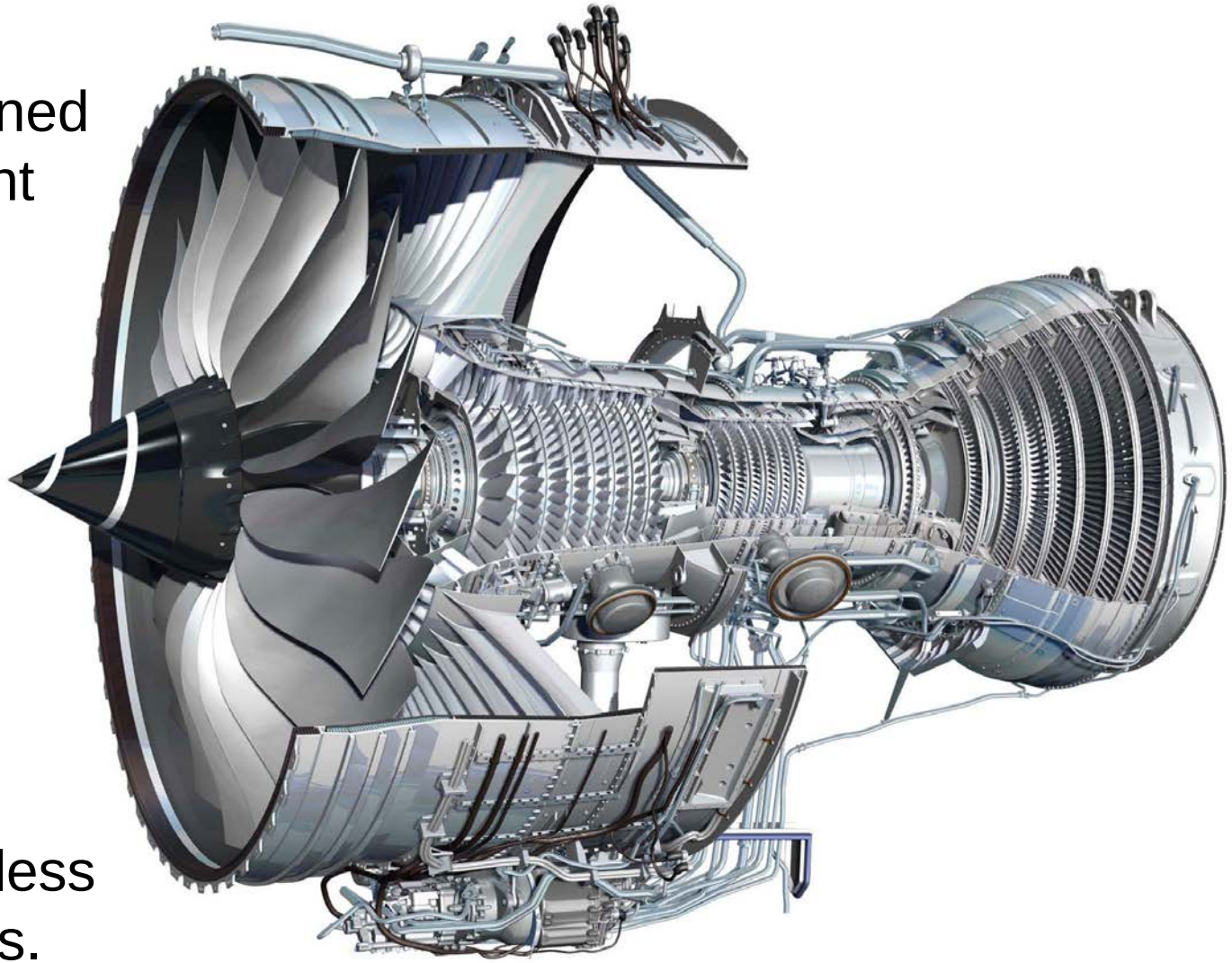
has developed a **mobile** ‘***canning line concept***’, which enables farmers to process and can their produce on the farm.

Rent-a-factory reduces food waste at the source and gives farmers an additional revenue.


Queen Mary 2
UP/HAUT
SURVITEC ZODIAC
COMMERCIAL LIFERAFTS
ON HIRE FROM
survitecgroup
Certificate Valid Until 6/2018
expertise you can trust
serviceuk@survitecgroup.com
survitecgroup
GLOBAL HIRE LIFERAFT
PROPERTY OF SURVITEC GROUP
SOLAS
SOLAS
Hired mission critical equipment, maintenance and tech updating are done in the factory on land.

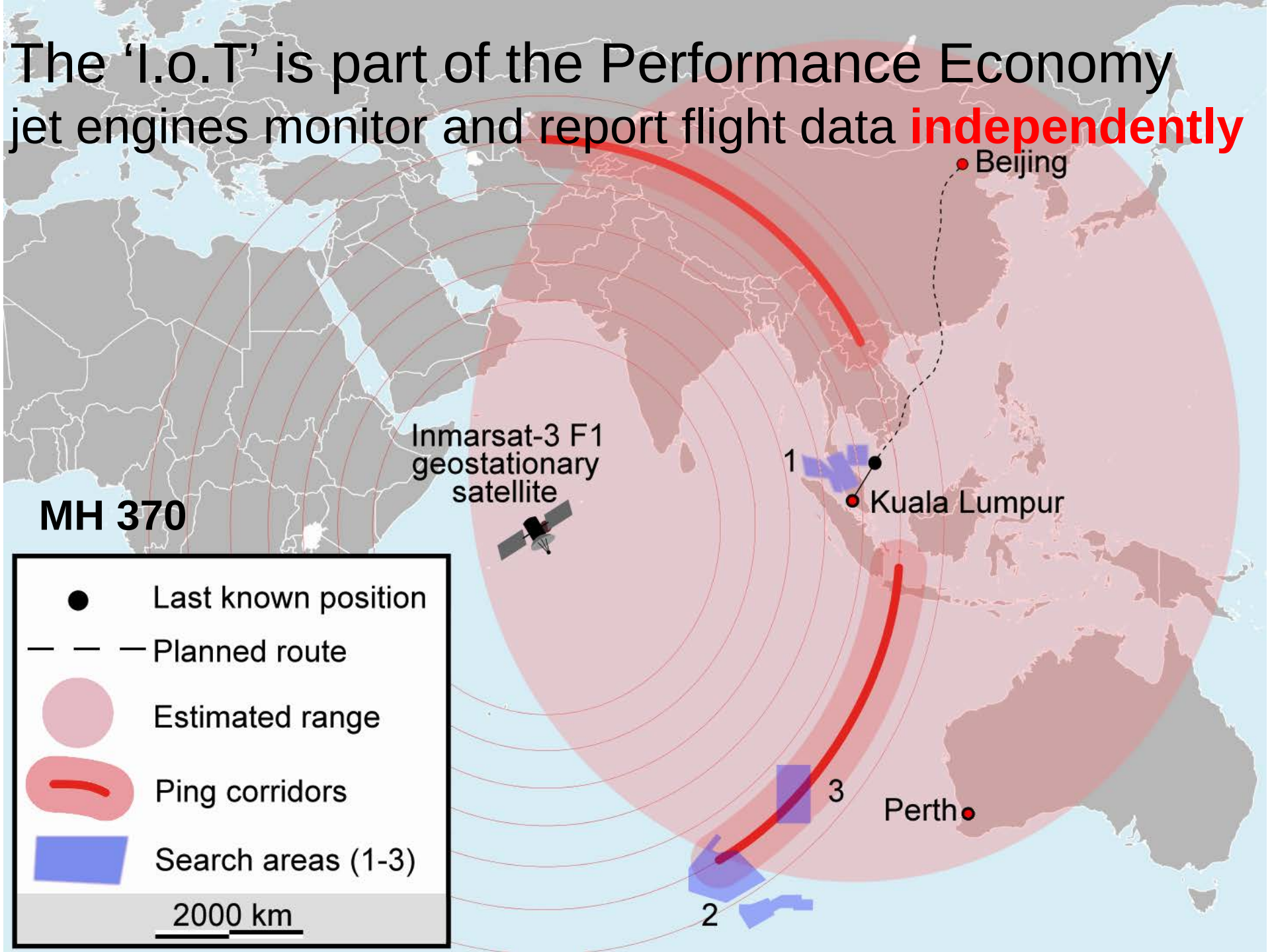
power by the hour, by Rolls-Royce 1

- Operational leasing combined with permanent monitoring and reporting of engine performance via satellite.
- Preventive maintenance and engine replacement enable spare-less repair methods.

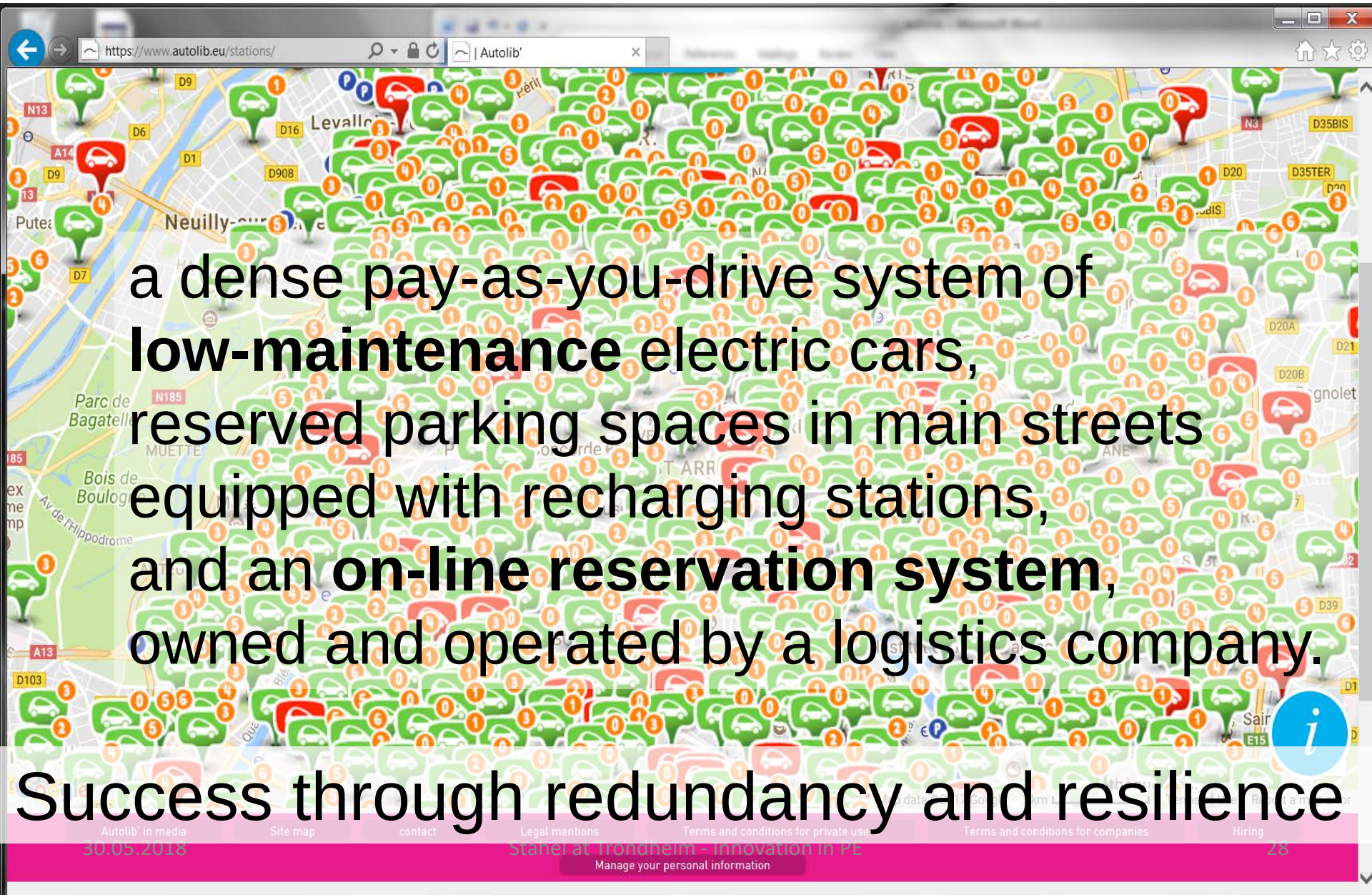


The ‘I.o.T’ is part of the Performance Economy

jet engines monitor and report flight data **independently**



Autolib Paris: **rent a car** when/where you need it




Mobike
cheap
low-maintenance
take-and-use rental bikes
mobike
mobike
Oxford, UK
Success through redundancy and resilience

3 Commercial innovation

GPS as a tool for service innovations in farming, present in all steps of the crop growth cycle

data analysis and evaluation

1 precision soil preparation

producing more food with less *(chemicals, water, energy)*

4 precision harvesting

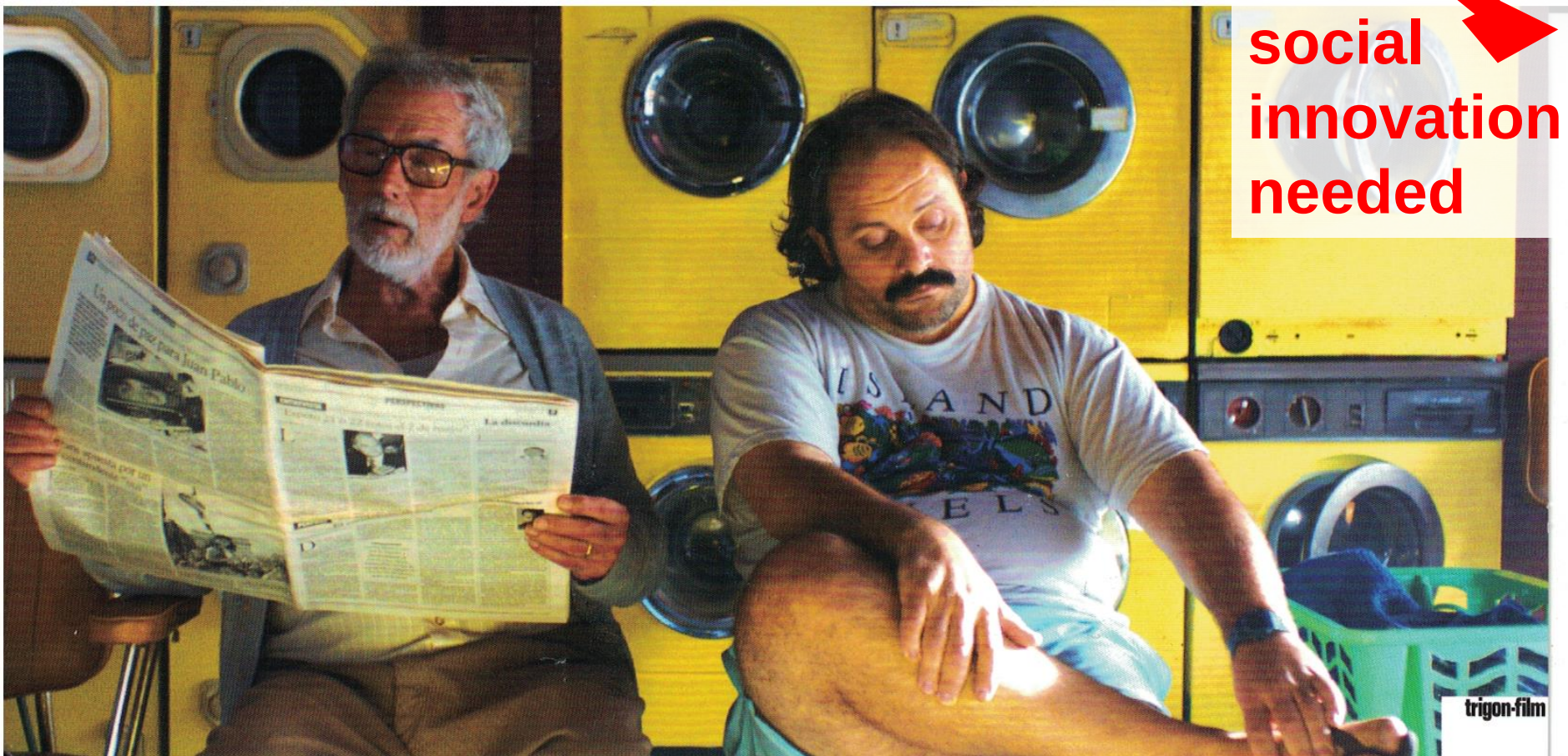
3 precision crop management

e.g. solar weeding robots (factor 20)

2 precision seeding

Driver & obstacle: social system design innovation

Laundromats need to be combined with animation, dancings, internet cafés, sewing services, to make them attractive for (single) clients; playgrounds?

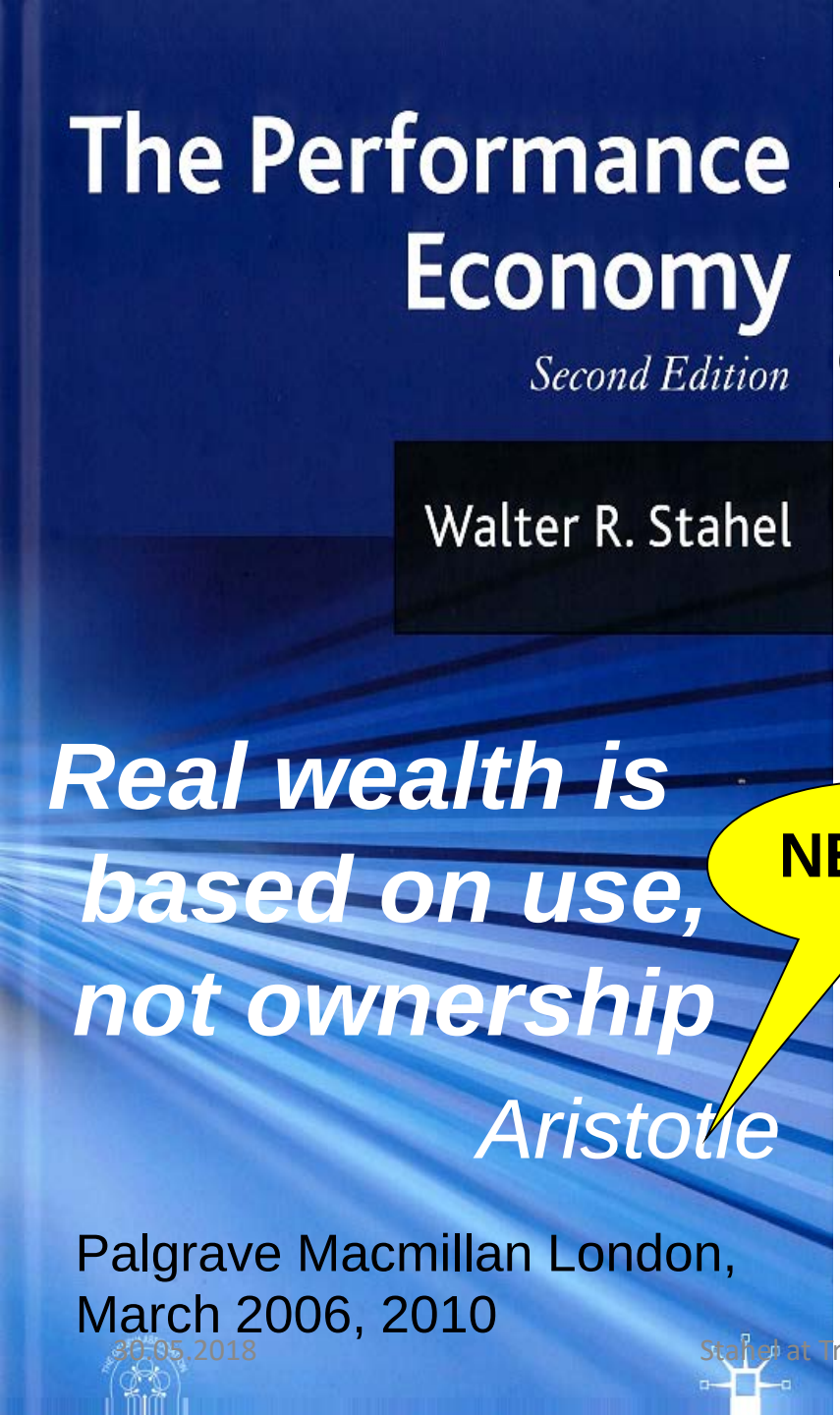


USM modular furniture as corporate strategy

Buy back for re-sale
by distributors

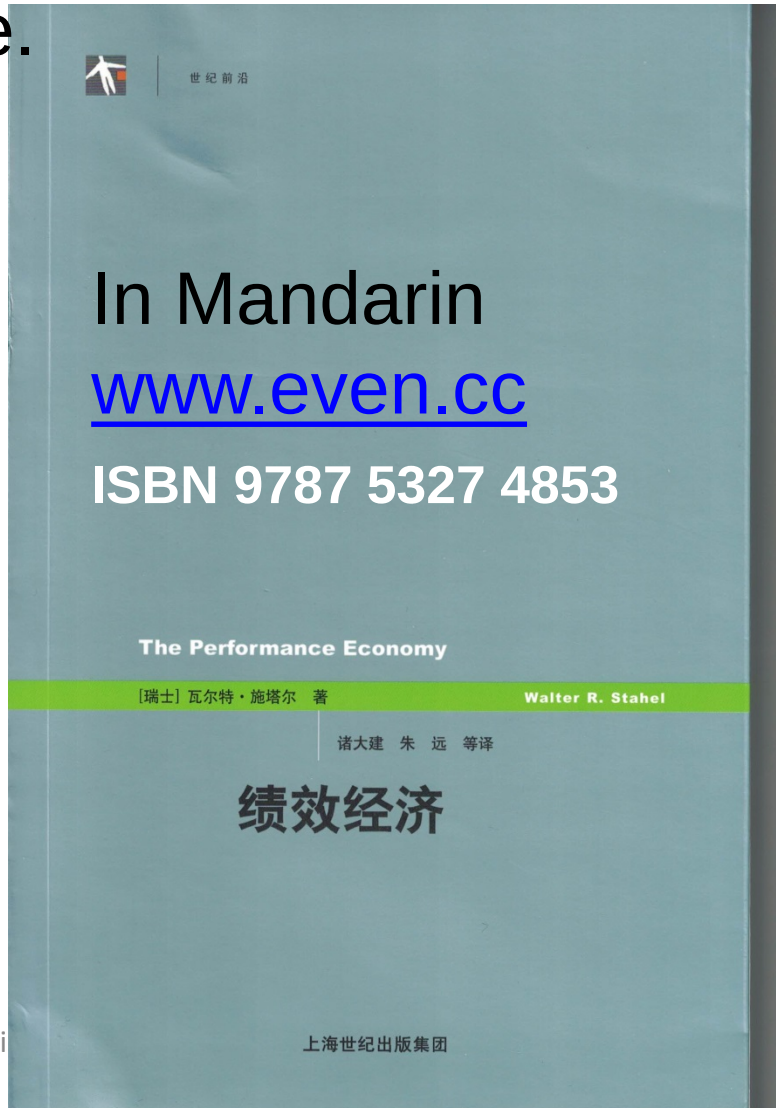
modular system design,
standardised components,
low maintenance materials

since 1965



- Producing performance,
- Selling performance, and
- Maintaining performance over time.

NEW ?



But

are the product,
the unpaid worker,
the client,
the victim,

ALL IN ONE !

Welcome to the Internet of Things (IoT)

Thank you for your patience,
have a pleasant dinner

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