

# Grand Challenges – Grand Opportunities for Innovation



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# Challenges

Scarcity of resources  
Social equity  
Globalisation and  
Urbanisation

Resilient  
Pathways

Opportunities

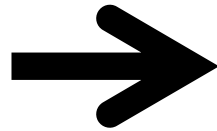
Challenge driven innovation



Transport



Buildings



Food



Water



Waste





Transport



Buildings



Food



Water



Waste







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## Oil Shock Drilling for Answers on High Prices

OVERVIEW | **DEMAND** | SUPPLY | CONSUMER | ALTERNATIVES | INDEX

### Oil Shock

## China's Cars, Accelerating A Global Demand for Fuel

By Ariana Eunjung Cha  
Washington Post Foreign Service  
Monday, July 28, 2008

SONGJIANG, China -- Nodding his head to the disco music blaring out of his car's nine speakers, Zhang Linsen swings the shiny, black Hummer H2 out of his company's gates and on to the spacious four-lane road.

**THIS STORY**

- Oil Shock: China's Cars, Accelerating A Global Demand for Fuel
- Transparency Sought as Speculators' Activity in Oil Market Grows
- China's Demand for Oil

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GALLERY


**China's Demand for Oil**  
China's increasing demand for oil is a key contributor to the dramatic rise in global oil prices.

» LAUNCH PHOTO GALLERY

Running a hand over his closely shaved head, Zhang scans the expanse of high-end suburban offices and villas that a

**TOOLBOX**

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# WORLD IN CONFLICT™

*Scarcity of resources*



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# Global supply of rare earth elements could be wiped out by 2012



Tuesday, January 26, 2010  
by Mike Adams, the Health Ranger  
Editor of NaturalNews.com (See all articles...)



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[Rare Earths Market Study](#) Freedomia Group - Reliable Insight Growth Rates, Country Market Size [www.FreedomiaGroup.com](http://www.FreedomiaGroup.com)  
[Land in the Wind](#) Energy-independent thanks to power and heat from renewable sources! [siemens.com/answers/islandinthewind](http://siemens.com/answers/islandinthewind)

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### BRAIN TRAINING GAMES

Improve your memory

"My favorite game is Raindrops!"

(NaturalNews) It's the bubble you've probably never heard of: The *rare earth bubble*. And it's due to pop in 2012, potentially devastating the industries of western nations that depend on these rare elements.

What industries are those? The automobile industry uses tens of thousands of tons of rare earth elements each year, and advanced military technology depends on these elements, too. Lots of "green" technologies depend on them, including wind turbines, low-energy light bulbs and hybrid car batteries. In fact, much of western civilization depends on rare earth elements

### Most Popular

Today | Week | Month | Year

- Scientists announce amazing findings: chocolate offers huge protection from heart disease and stroke
- Federal gestapo illegally raid Gibson Guitar factories, arbitrarily confiscate millions of dollars worth of wood used

DIABETES? BEST NATURAL TREATMENT

CHOLESTEROL?

BERKELEY LIGHT WATER FILTERS

Skin Tags? USA TODAY CNN

The Of Pec Don





426,000 cell phones to waste in the US every day.





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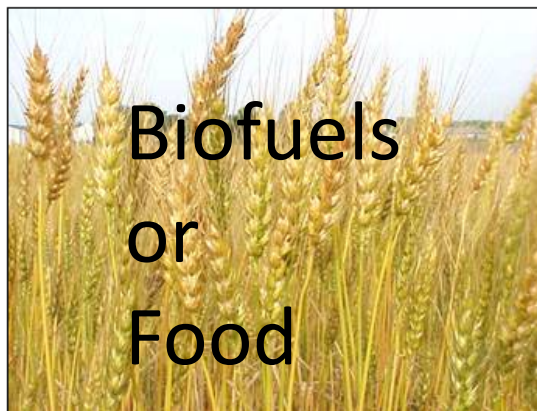
# NEWS : INTERNATIONAL

Last Updated: Sep 12th, 2007 - 01:58:01

## OECD report calls for end to biofuel subsidies; Food price surges and damage to the environment consequence of current policies

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By Finfacts Team  
Sep 11, 2007, 09:25



The futures price of wheat hit a record high of \$8.86 per bushel on the Chicago Board of Trade last Wednesday. That's more than double the September 2006 price of \$4.22 a bushel, said Mary Haffenberg, a CBOT spokeswoman. The price of wheat for December delivery fell Thursday to \$8.24 a bushel. The price is up by 60 percent this year.

In the US, biofuel, which is subsidised, accounts for about one-fifth of the corn crop. The lack of acreage for other crops, such as soyabeans, pushes their prices up too. Last summer, the US Department of Agriculture reported that farmers planted 19 per cent more land with corn this year than last, while soyabean acreage fell by 15 per cent.

Governments should end subsidies for biofuels, as the demand for grain for the alternative energy industry result in surging food prices and the potential destruction of natural habitats. the Organisation for Economic

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[Wednesday Newspaper Review - Irish Business News and International Stories](#)

[Oil price moves towards record despite OPEC plan to increase production](#)

[Wheat price rises to new record as markets await key US Department of Agriculture report](#)

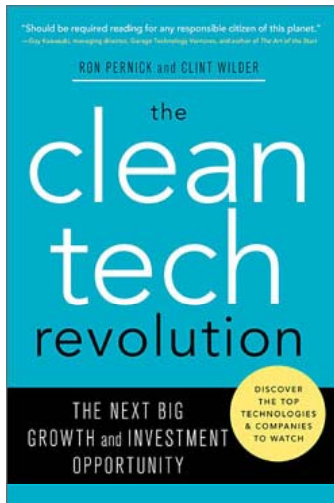
[Dr Peter Morici: US records \\$59.2 billion Trade Deficit in July; Oil, China and Autos push up deficit](#)

[US home prices are likely to end 2008 below 2006 peaks as slump is now seen as worse than previously forecast](#)

[US Trade Deficit fell slightly to \\$59.2 billion in July; Deficit with China expanded to \\$23.8 billion](#)

[OECD report calls for end to biofuel subsidies; Food price surges and damage to the environment consequence of current policies](#)

[Global Manpower Employment Outlook Survey reveals strong hiring plans ahead for Japan, Germany, India, Sweden and Australia:](#)



# Investing in Clean Energy

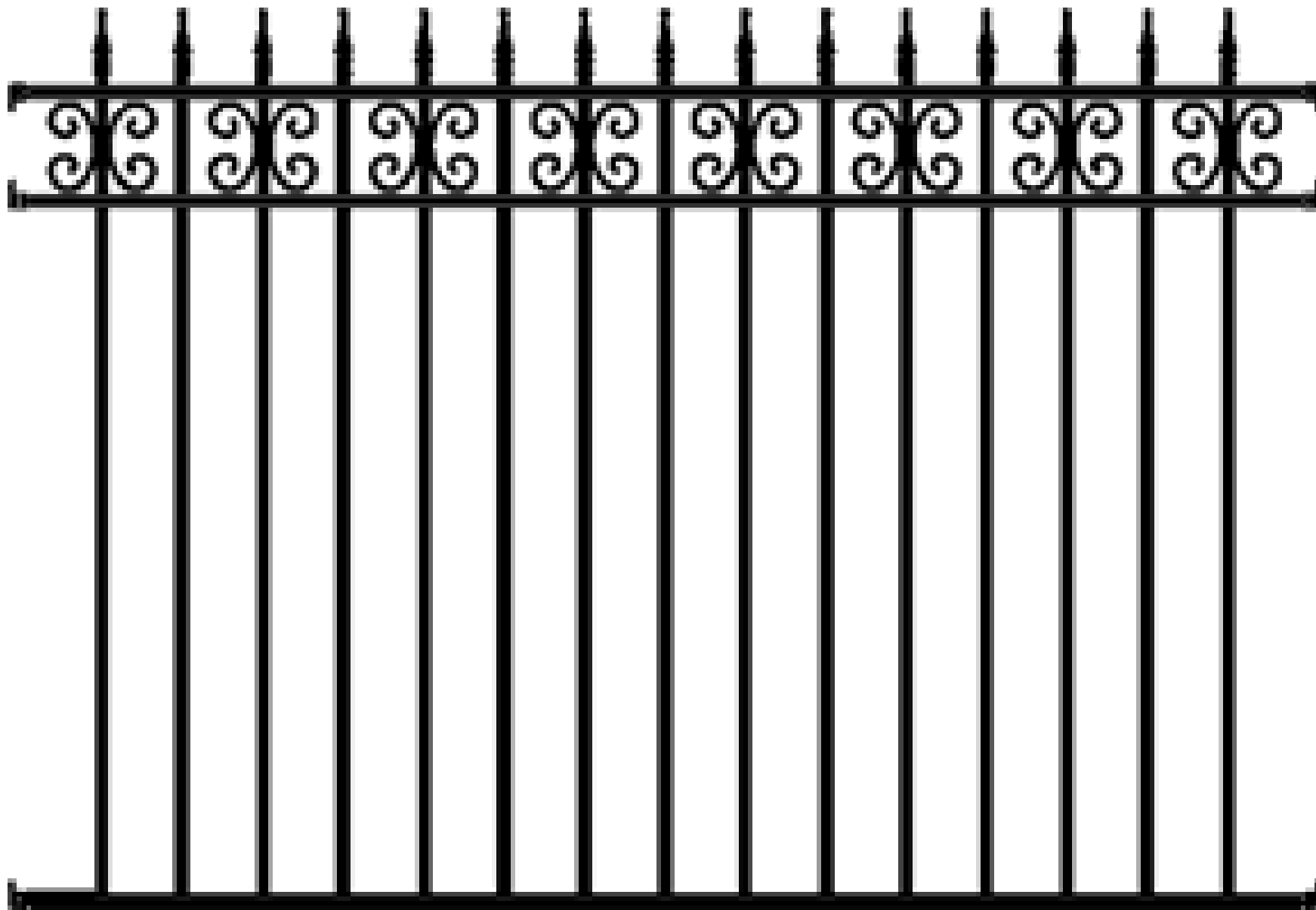
Cleantech Update and Reception



Tuesday, February 6 • 4:00-5:30 p.m.

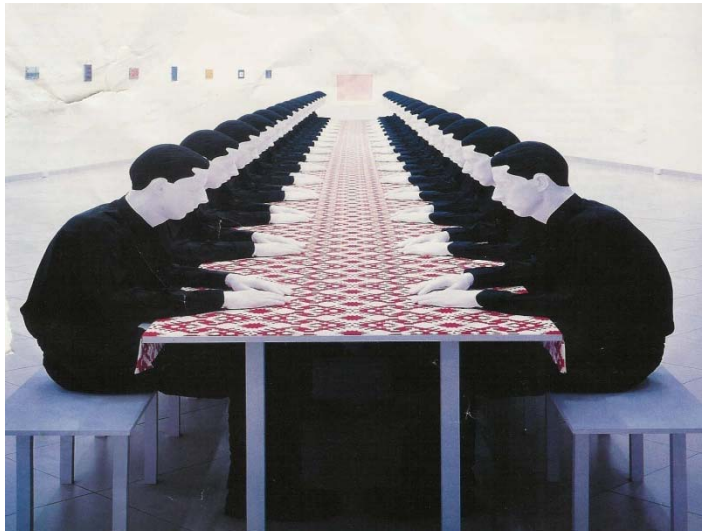
Companies which can come up with solutions for the problems will have immense bussiness oportunities.

# Which are the obstacles?





Knowledge is fragmented





Urban planners



Architects



Civil  
Engineers





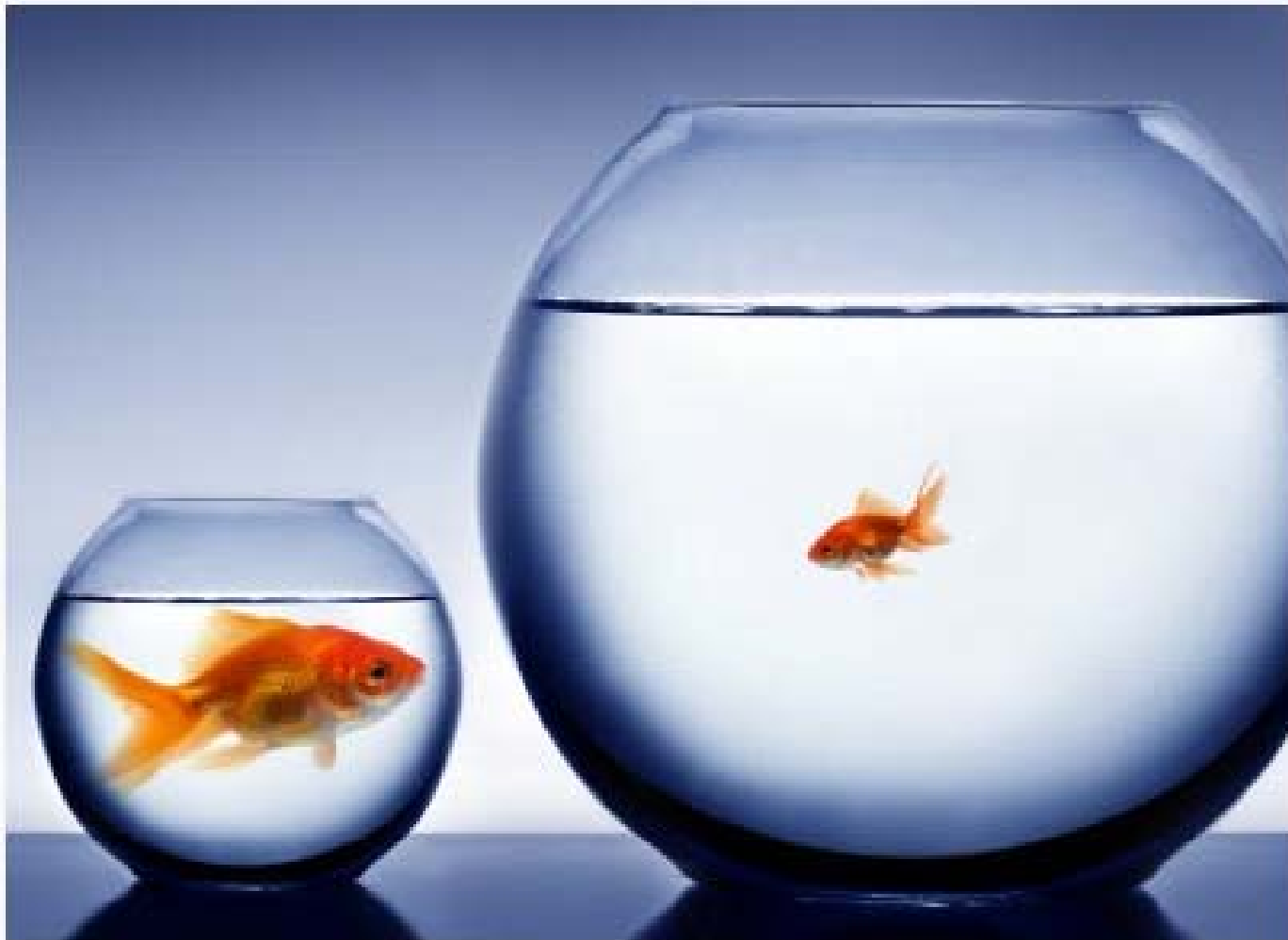
Ronald Wennersten/Industrial Ecology



We will need multidisciplinary students and scientists taking a system perspective in order to turn the great challenges into great opportunities



To solve the small challenges  
you need to face the great challenges



And to think out of the box

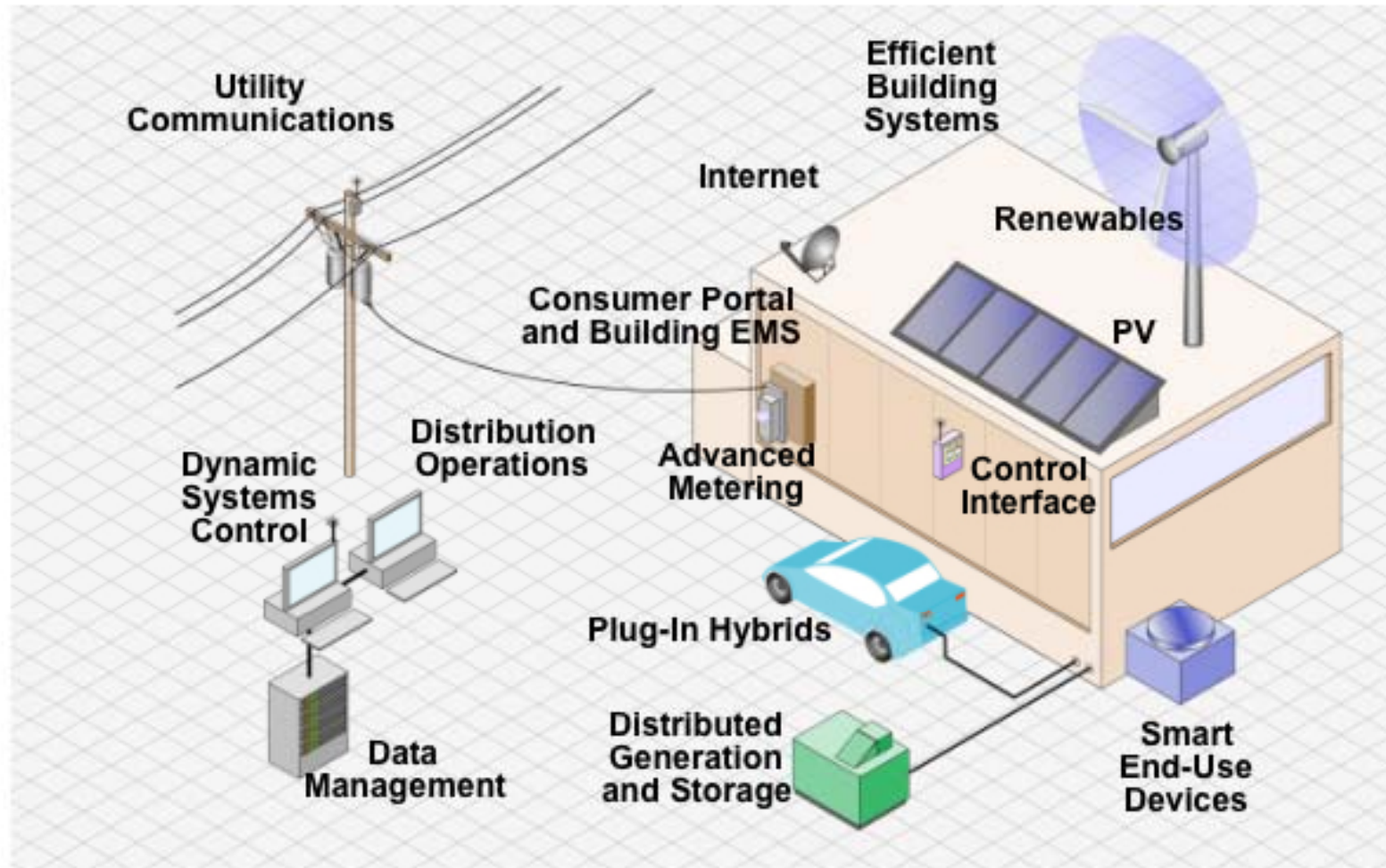




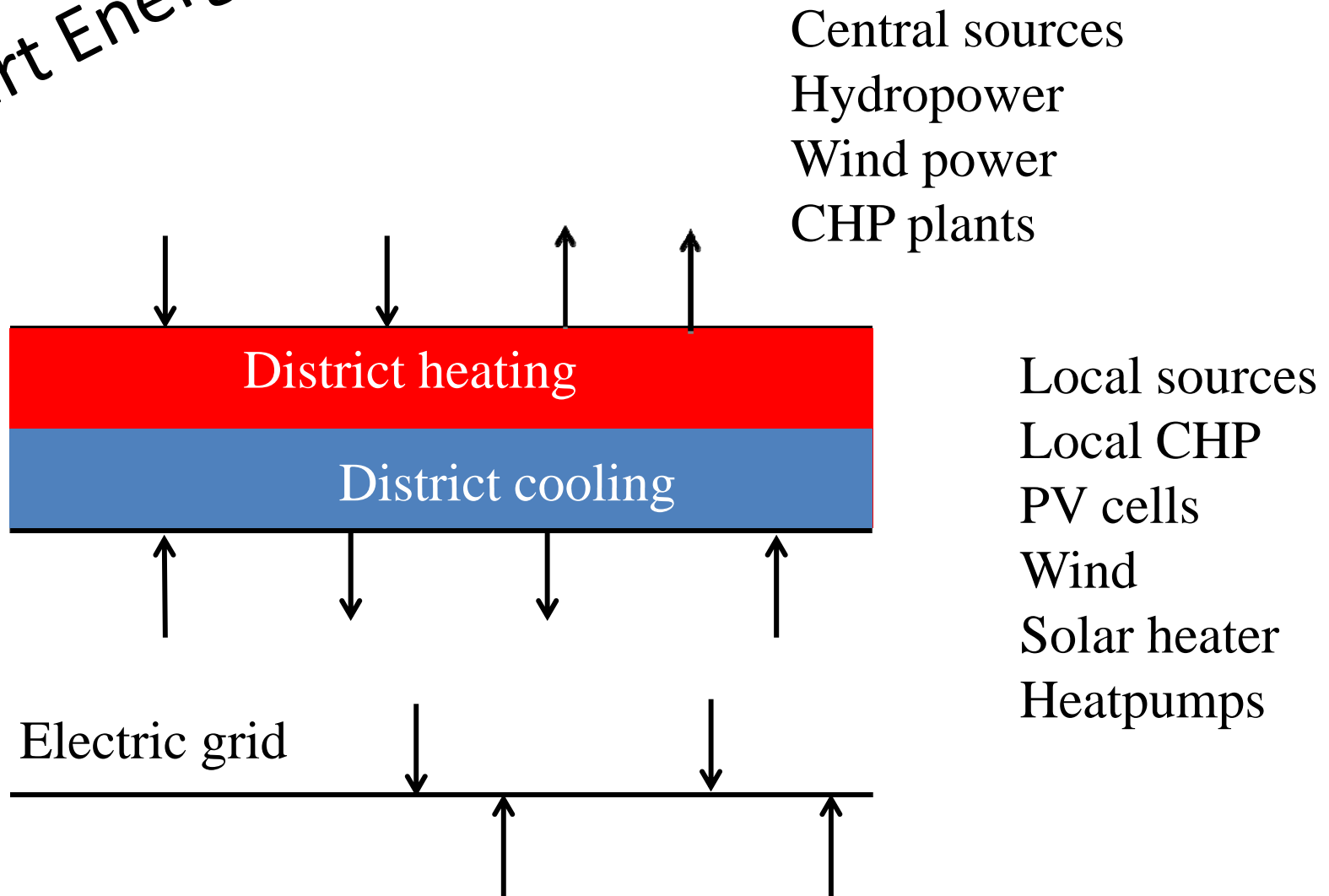


Combining product with systems innovation

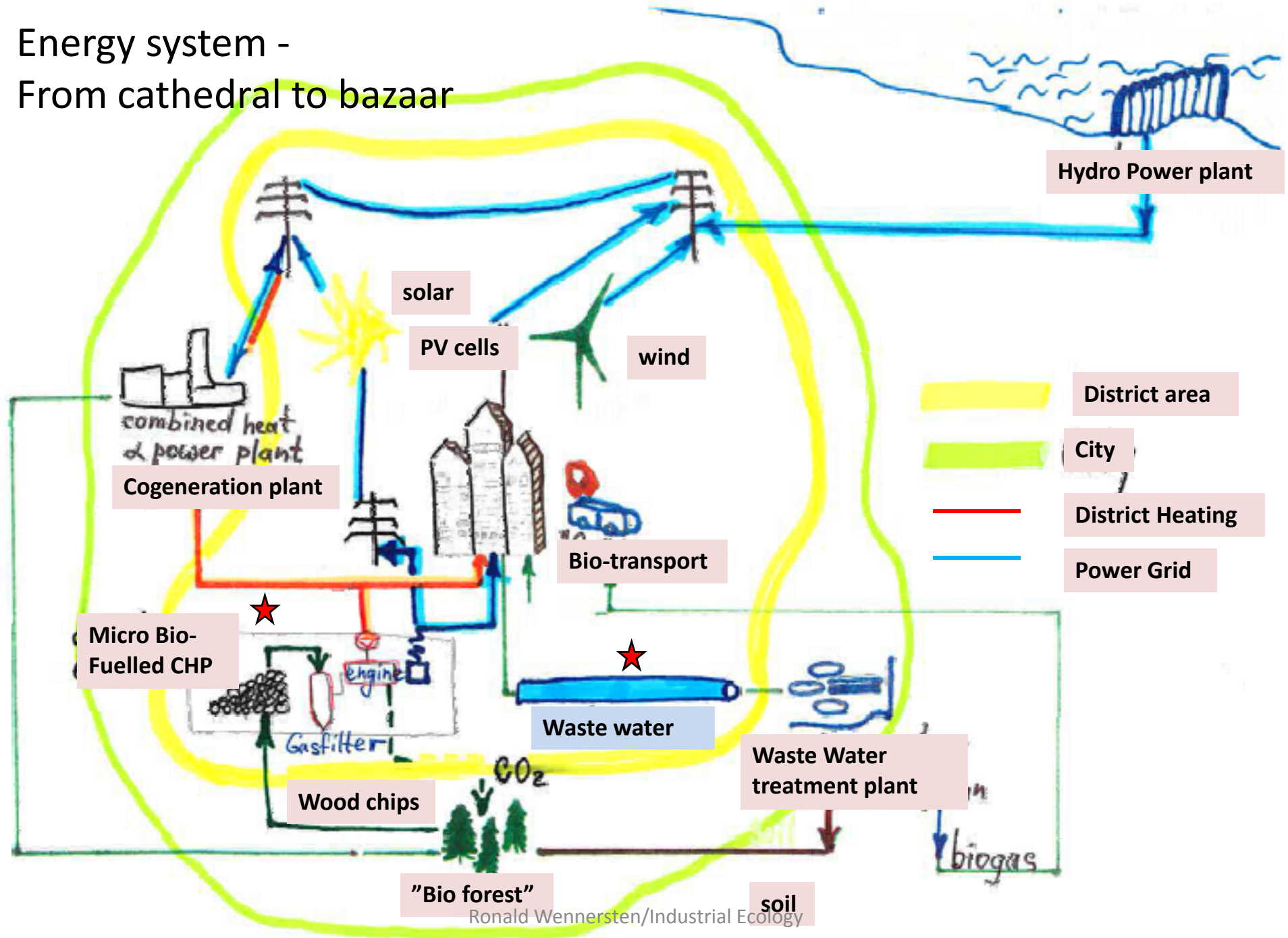
# Investment in “Smart Grid” electricity infrastructure will be needed....



# Smart Energy



# Energy system - From cathedral to bazaar





# Royal Seaport




Source: Aero Design System



# Patent system favour low level solutions

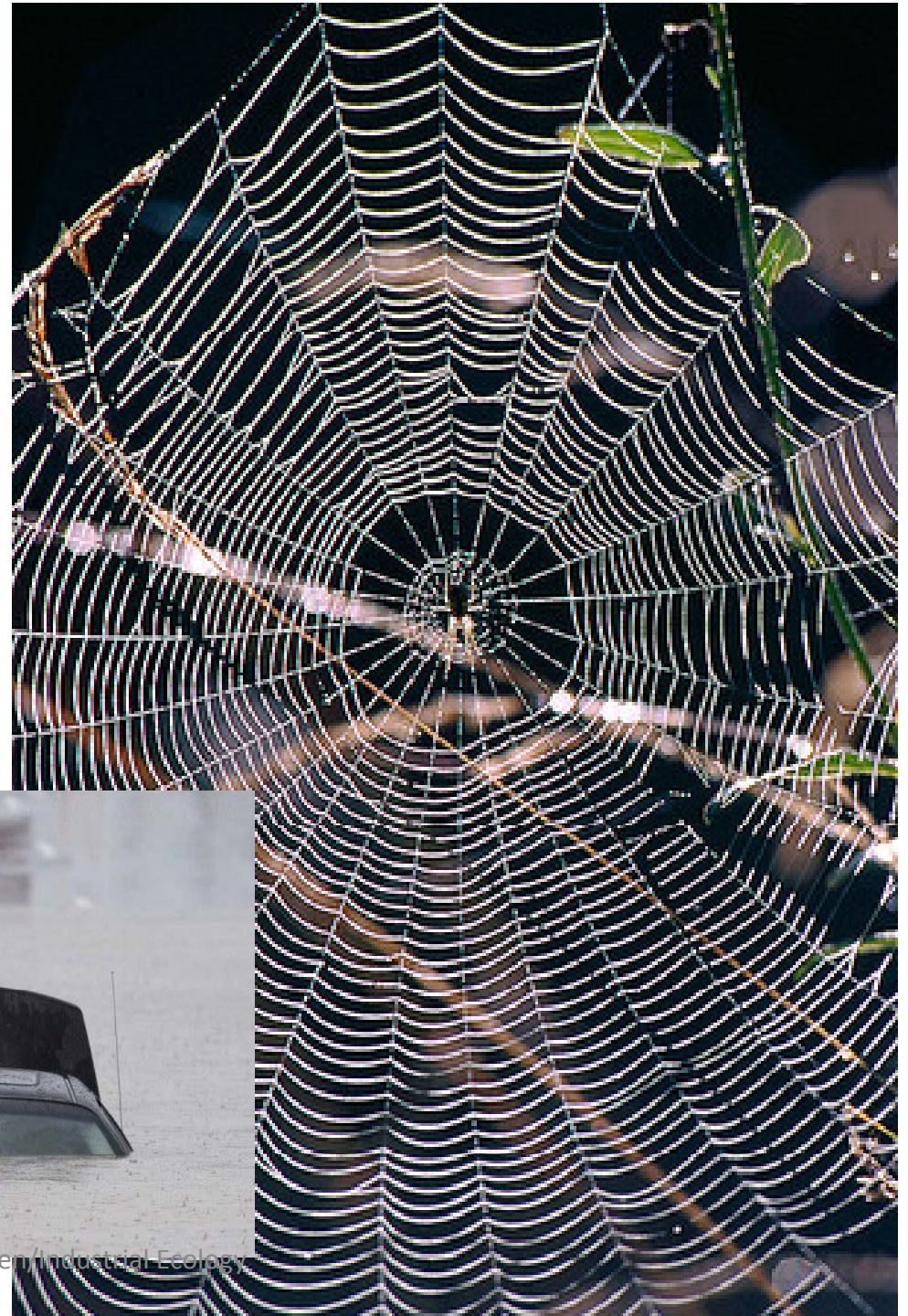


A glowing crystal ball is held by two hands, one on the left and one on the right, against a dark background. The crystal ball is bright yellow and white, with a soft glow around it. The hands are positioned as if they are holding or presenting the crystal ball. The text is centered over the crystal ball.

The most important  
events that will change  
the future cannot be  
predicted



# Resilience



Ronald Wennersten/Industrial Ecology



# Many innovations are ahead of time and imagination

How much  
imagination  
do people in  
funding  
organisations  
have?



**TST**  
TAIWAN  
SUPERCritical  
TECHONLOGY

中文版 | English

**technology**

- ▶ Supercritical fluid
- ▶ Ultrasonic

**product**

**CLEANING  
EQUIPMENT**

- + Ultrasonic Cleaning
- + CO2 Cleaning
- + High Pressure Cleaning



TST CO2 dry cleaning technology has awarded as target promotion

> Cleaning Equipment > CO2 Cleaning > Liquid CO2 Cleaning



Name: **Solvair CO2 clothes washing machine**

No:

- Info:
- 1. the most effective cleaning available
  - 2. environmentally friendly
  - 3. high productivity and competitive Costs
  - 4. Service and support from street

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## Apple is the biggest company in the world

By *Emma Haslett* Wednesday, 10 August 2011

With a value of \$341.5bn, Apple has taken a bite out of Exxon to become top of the stocks - although that hasn't stopped it from fiercely protecting its IP...



Tagged by: *Apple, iPhone, iPad, IT & Telecommunications, ExxonMobil*

Given the trabbocant devotion displayed by some of its fans, there was an air of inevitability about this: Apple has pipped Exxon to become the largest company in the world, with a market cap of \$341.5bn (£210bn), just over the oil company's \$334bn. It's largely thanks to the fall in oil prices which has hit producers all over the world. But it also marks a peak for Apple's 14-year rampage over its competitors – the latest of which is Samsung, which has come a cropper over its iPad-alike.

It's no wonder Apple's popular: the company delivered \$7.3bn of profits last quarter, while its share price hit \$400 for the first time last week (just before the markets started to yo-yo). Although Exxon's revenues still dwarf Apple by comparison, it managed to make \$28.6bn last quarter – not small change, by any stretch of the imagination. Even as the markets were still looking decidedly dodgy yesterday, its share prices still jumped by 3.5% to \$365.13.

Mind you, that's not to say that Apple doesn't have challenges to face. To

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### Further Reading

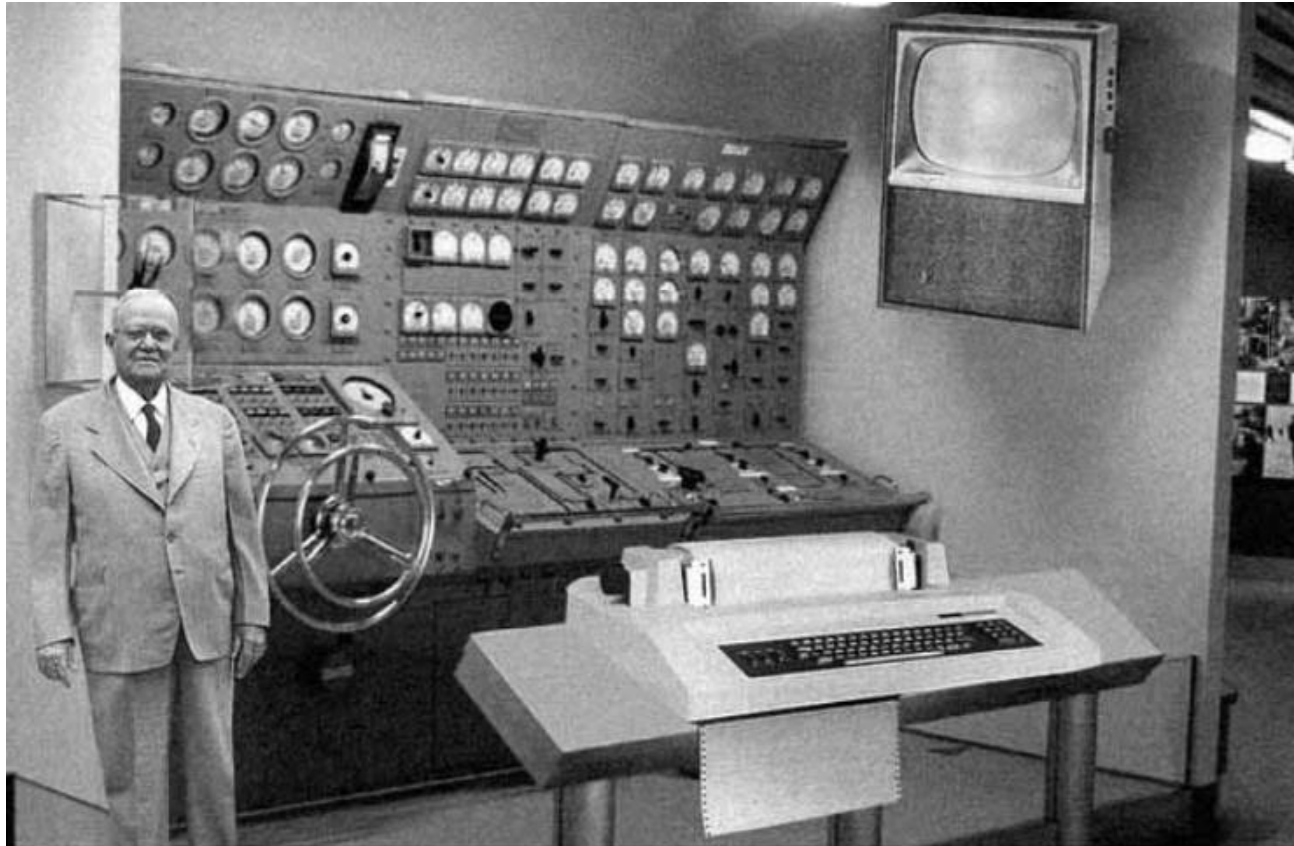
- Jobs gives up his job, but can Apple go on without him?
- Is Apple employing pirate-busting tactics?
- Android doubles share of smartphone market
- UK IP heads for 21st century
- Land of the Free, sponsored by Apple?
- Rivals stay at Arm's length with 25% rise in profits

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### Latest Tweets About MT

## Imagination of a future PC in 1954



Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home.

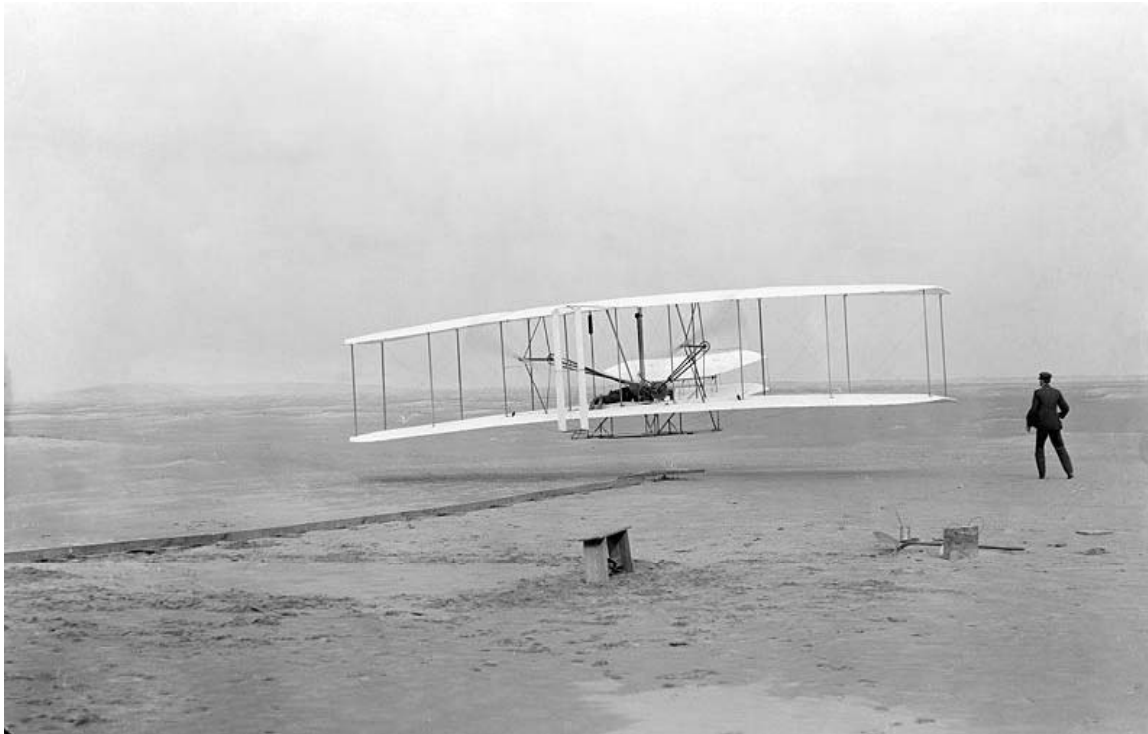


**“Heavier-than-air flying machines are impossible.”**

Lord Kelvin (26 June 1824 – 17 December 1907)

British mathematical physicist and engineer.

## First flight of the Wright Flyer I, 17 December 1903



The distance over the ground was measured to be 260 m; the time of the flight was 59 seconds.

Imagine that you were there



Would you invest your money in this technology?

Could you imagine this?

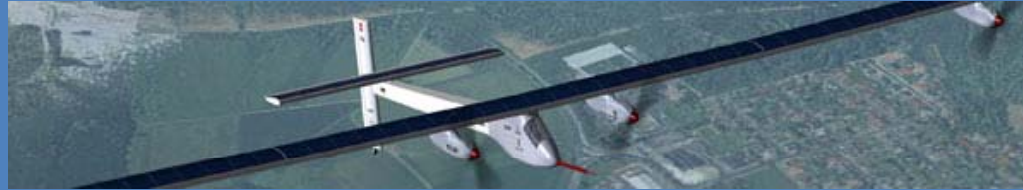
Airbus A380



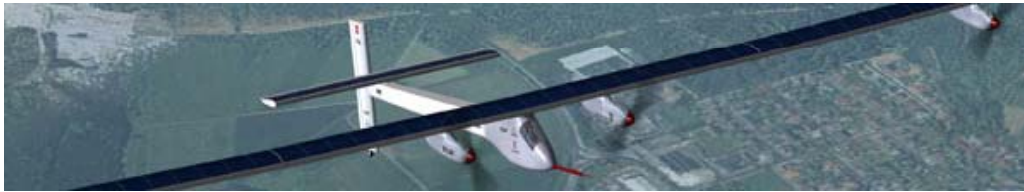
Provides seating up to 853 persons



# Solar Impulse



# Solar Impulse



## **Aerodynamics**

The wingspan of *Solar Impulse* is 80 metres, slightly wider than the wingspan of an Airbus A380. The ultra-light structure must use customised carbon fibres.

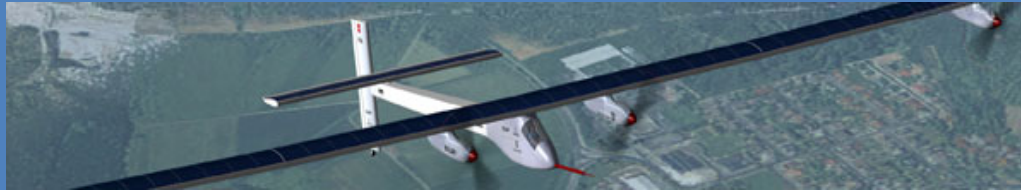
## **Energy**

Photovoltaic cells will generate electricity during the day, which will serve both to propel the plane and to recharge the batteries to allow flight at night.

## **Propulsion**

The average power provided to the engines will be on the order of 12 hp, comparable to that of the Wright Flyer

Can we imagine how an airplane will look in one hundred years?



[www.solarimpulse.com](http://www.solarimpulse.com)

Thanks!