Use of Horizon scanning and wild cards in Foresight

International workshop December 9th 2011

Methodology and practice of foresight studies

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Moscow

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This presentation

- Knowledge about the future: the use of “Forward looking” activities in public policy
- Scanning of future horizons
- The use of the wild card concept

Forward looking activities
(knowledge about the future)

- Quantitative – Qualitative
- Normative – Explorative
- Expert – Participatory approach
- Disciplinary, Thematic, Technology, Environmental or Socio- Economic oriented

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- Terms used: modelling, simulation and gaming, forecasting, scenario‘s, backcasting, roadmapping, future (horizon-environment)scanning, trends,weak signals, early warning signals, wild cards, disruptions , transitions etc

Knowledge about the future

- Engineering tradition (natural science approach, using laws of nature) – *mega constructions* – predictable systems
- Planning tradition (from statistics to modelling) *economic modelling, climate modelling* – predictable if we know the variables
- Military tradition (monitoring, scouting, spying - scenario's, gaming) – *warfare* - eyes and ears wide open and rehearse all kind of eventualities
- Social science traditions (learn from history, participation, measuring desirability, influencing behaviour)

Knowledge about the future for the government

- Forecasting, future advice based on engineering - planning – military tradition (trying to describe and give options - usually not creative)

  Usually accepted & embedded

  Scientific advice -Planning agencies – Statistical bureau's

- Foresight (adding social sciences– role of actors with (opposite) desires – participatory approaches – adding the creative aspect)

  Accepted in many places & sometimes temporarily embedded (in policy domains)

  S&T foresight in UK, France, Netherlands in the nineties, Now Foresight & Strategic Units, Independent bodies, Finnish commission for the future etc

- Horizon scanning (mixing the traditions – integrative approach – complexity – adding resilience in complexity – creative)

  Accepted in some places UK, Singapore, Netherlands, Denmark, sometimes embedded Singapore and Horizon-scanning centre in the UK

Horizon scanning

Horizon scanning as integrated approach

Horizon scanning

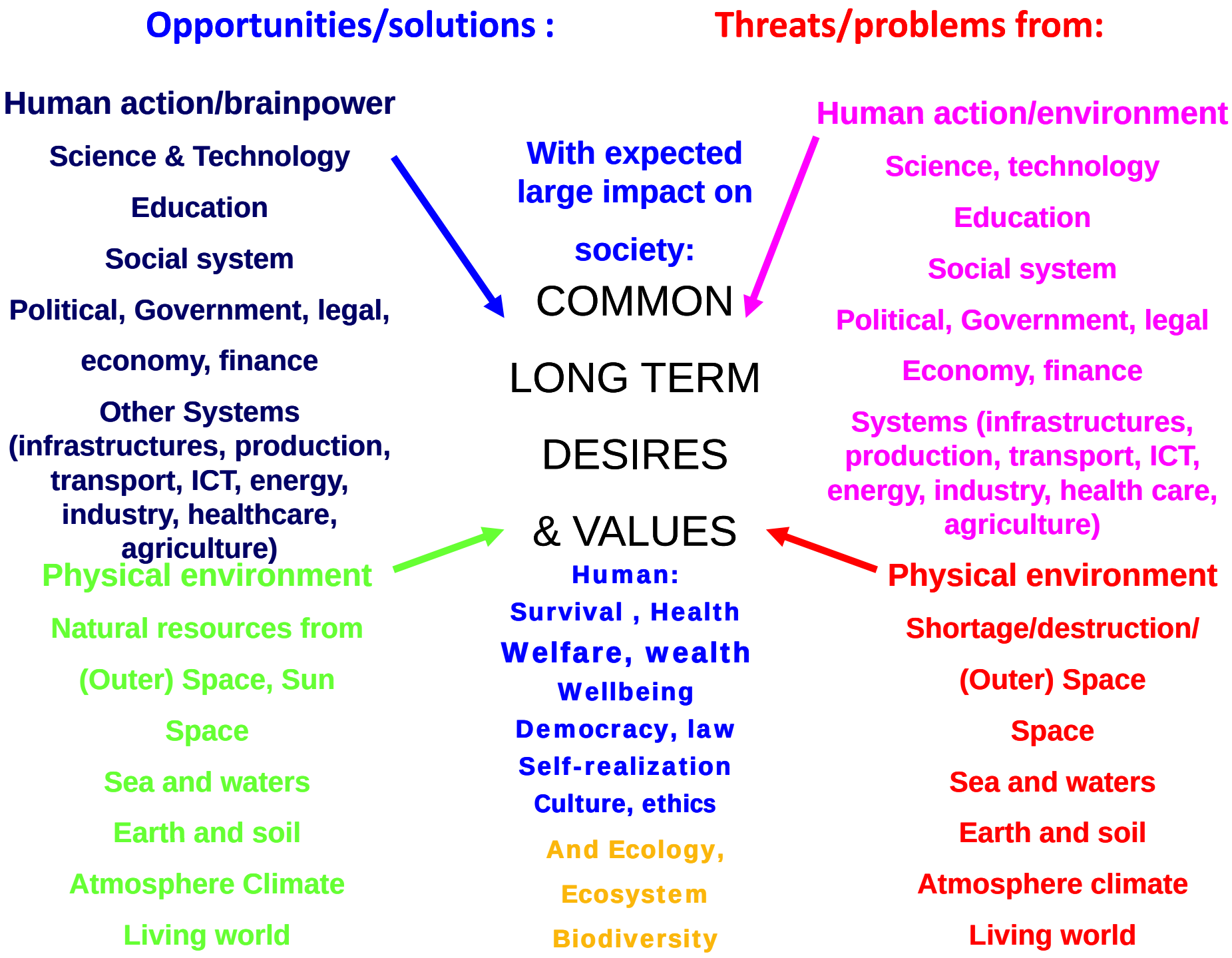
Horizon scanning is an instrument to shape the future to (common) desires, needs after participative thinking and debating

Horizon scanning

Systematic Search for Issues with Potential high (Future) Impact on what we consider to be important

Issues are statements/stories about the future, based on outcomes of research, trend analysis, scenario studies, weak or faint signal analysis but also on human imagination

Issues are therefore based on a mix of scientific knowledge and tacit knowledge including our imagination


Opportunities/solutions :
Threats/problems from:
Human action/brainpower
Science & Technology
Education
Social system
Political, Government, legal,
economy, finance
Other Systems
(infrastructures, production,
transport, ICT, energy,
industry, healthcare,
agriculture)
Physical environment
Natural resources from
(Outer) Space, Sun
Space
Sea and waters
Earth and soil
Atmosphere Climate
Living world
With expected
large impact on
society:
COMMON
LONG TERM
DESIRES
& VALUES
Human:
Survival , Health
Welfare, wealth
Wellbeing
Democracy, law
Self-realization
Culture, ethics
And Ecology,
Ecosystem
Biodiversity
Human action/environment
Science, technology
Education
Social system
Political, Government, legal
Economy, finance
Systems (infrastructures,
production, transport, ICT,
energy, industry, health care,
agriculture)
Physical environment
Shortage/destruction/
(Outer) Space
Space
Sea and waters
Earth and soil
Atmosphere climate
Living world

Horizon scanning

United kingdom

Netherlands

Denmark

Adviesraad voor het Wetenschaps- en Technologiebeleid

European Foresight

EFMN
European Foresight Monitoring Network

horizon

SESTI

iKnow interconnecting knowledge

Definition and criteria emerging issue

Emerging issues are storylines (Future Narratives) with:

- High impact (on what we value and our activity to achieve this)
- Plausible storyline (including factual basis –reliable sources)
- Novelty (is the issue described really new for the policy makers)
- Changeability (Can the story or its impact be altered by human action)
- Policy relevance (does the issue relate to present day decision making and action and on different levels)
- Emotional aspects and critical aspects (does the issue appeal or concern emotional and or ethical legal aspects)
- Interests at stake (commonalities and or conflicts)

Issue dimensions

IMPACT : Issues that may have great or less great impact on what we see as important (seize of impact)

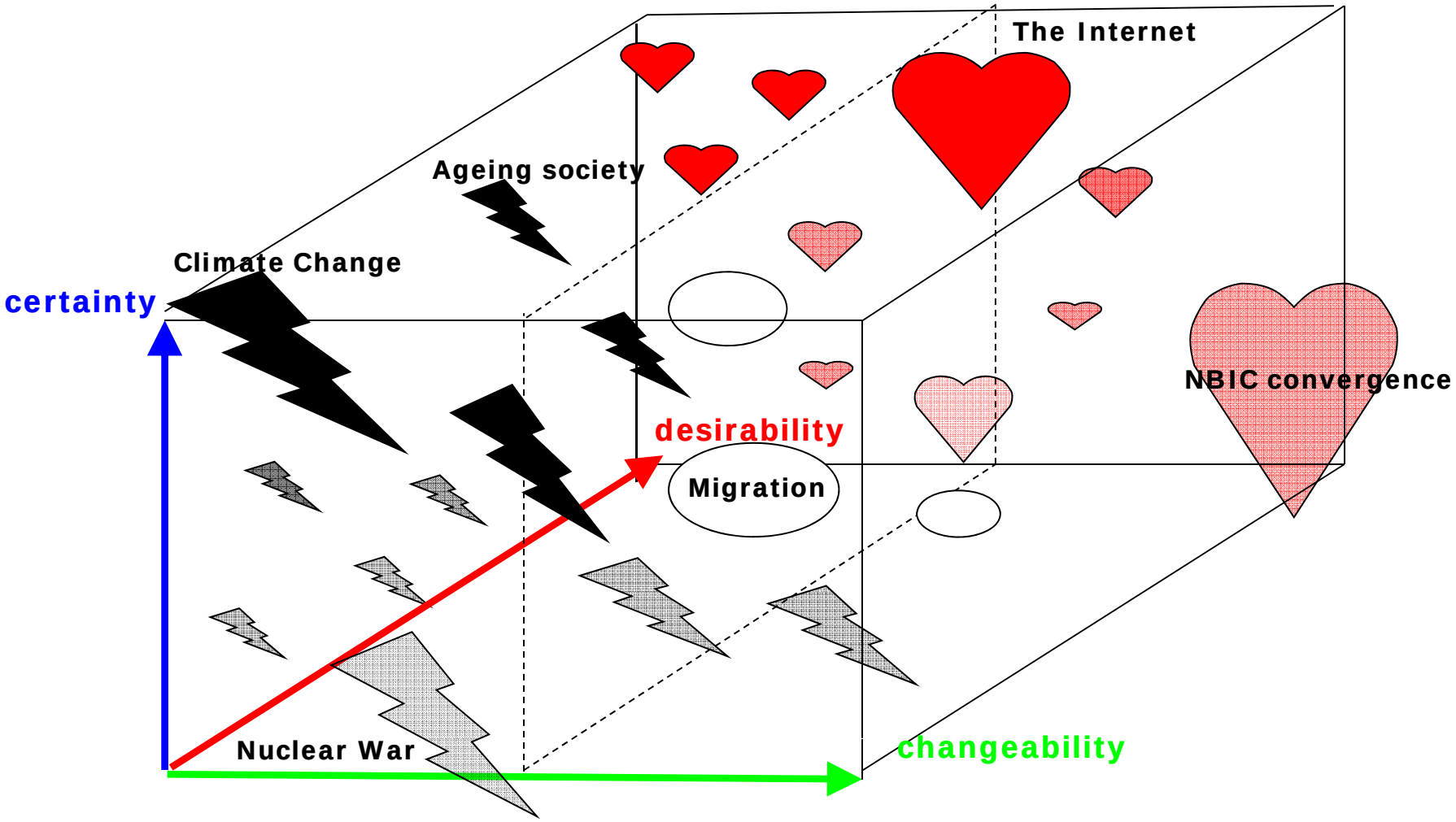
PROBABILITY & PLAUSIBILITY : Issues that are certain or less certain but still plausible (probability and plausibility)

DESIRABILITY : Issues that are desirable or not desirable for society (desirability, common or opposed values)

CHANGEABILITY : Issues that are not changeable or changeable by human action (changeability)

TIME : moment of observation , interaction, dynamics

+ Issues with Potential high Impact on what we consider to be important



Sources and tools for scanning

Non participative / (digital) written sources

- Systematic manual scanning (internet –search engines)
- Literature study
- Text mining

Participative / stakeholders & experts

- Survey
- Wiki
- Blogs/linked In /and others like Facebook
- Twitter
- Workhops etc

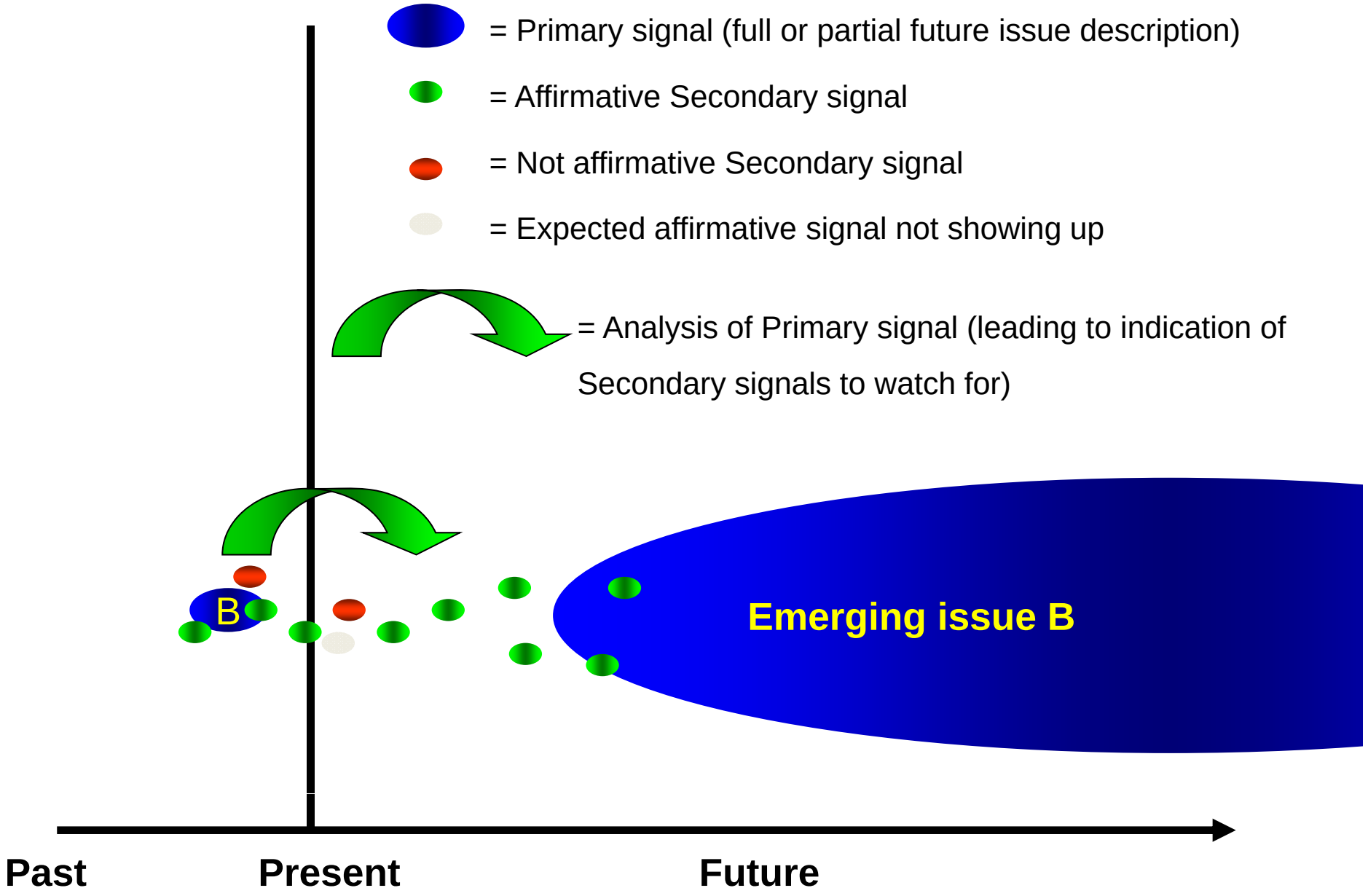
Systematic Internet scanning

- Internet Search on internet using search engines provided by : google / bing
- Google selects all pages (texts & vids) with the “search string”
- sorts the pages that are most connected/central

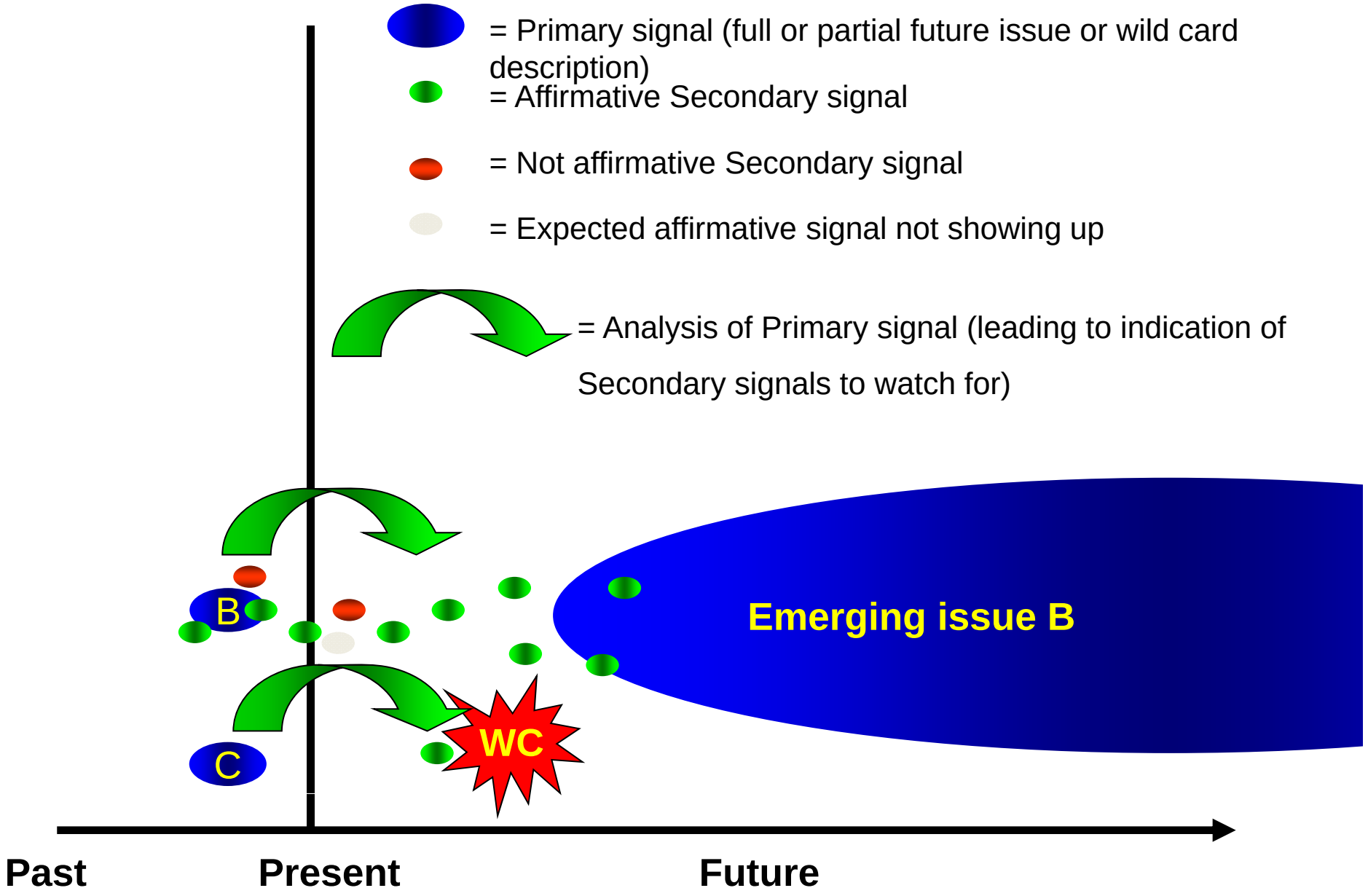
Needed

- Qualified scanners (fast interpretation)
- Frame of reference (coordinates/for which domain does the scan take place/criteria)
- Intelligent questions
- Workhops

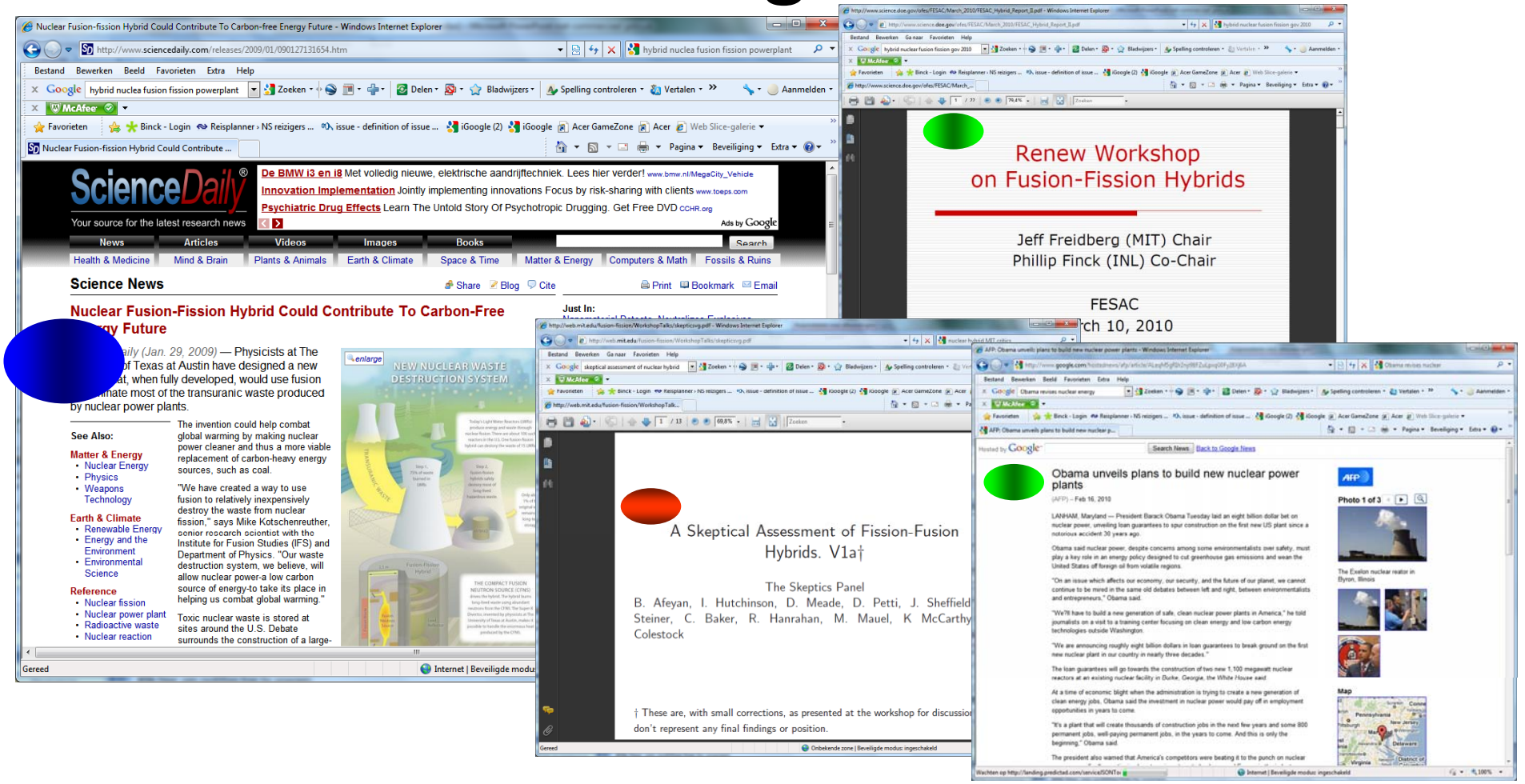
The principles of Issue / Wild card Centered Scanning



The principles of Issue / Wild card Centered Scanning



Primary signal & secondary signals



wild cards

- An event or serie (cascade) of events (with seemingly low probability?) that changes the settings of our world completely (causing high impact shocks/disruptions)
- Which we hardly see or we do not want to see
- Earth quakes of the mental landscape (Karlheinz Steinmuller), black swans (Nassim Nicholas Taleb)
- Once every 2 to 3 years we have a world wide wild card which moves the world
- examples – War in Iracq – 9/11 - financial crisis – Iceland volcano and deep sea oil leak

Types of wild cards (1)

- Tension building - almost invisible trends or sequence of events (Arab spring, suppose: long term effect of UMTS causes infertility)
- Sudden (un)expected events with a known very low or unknown probability but which we know will happen on basis of historical Evidence (large earthquakes, breakthrough medicine), where when and how????
- Sudden unexpected events wich may never occur but can be imagined and which if they happen have an unavoidable character (aliens landing)
- The unimaginable (the real black swan?) ??????

Types of wild cards (2) (3)

- Nature caused (volcano, earthquake etc)
- Human caused (non intentionally, industrial accident, panic in the crowd , berlin wall , **intentionally**, terrorist attack)
- _____
- **That have happened**
- That may happen : **Imagined** (by author ---------- by imagination process)or search for potential wild cards (i-Know, Far horizon)

Imaginary wild cards

- **Narratives** with Facts , Impacts, Novelty, Plausibility, interests, desires (wish , fear , ideal, lobby cards)

- Instruments to **shape or shake future to desire/ideal/interests of card initiator**, sometimes deliberately opposite to desire (evoking fear)

- **Strength of a card not only facts**> Assessment should look at , facts , logics, but also who is initiating the signals for what reason, what are the interests and values that are at stake, who is relaying, supporting, who is blocking or opposing, what is the message doing with emotions of the receivers etc

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- **(SESTI) Searching** Published Imaginary Wild cards (initiators action) or **(Far Horizon, i-Know)** Wild cards **creating** on demand

The use of imaginary wild cards

- Alerting on disasters and opportunities to adjust policies to prevent, adapt or countervail **bad cards** and optimise harvesting of the **good ones, search for signals can we predict?**

- Instrument to **test robustness** of strategies and plan (enhance resilience), **what may disrrupt our business?**

- Creative or inspiring tool **opening up new surprising options what may help us to conquer the world?**

- Instruments to **shape or shake future to desire/ideal/interests of card initiator**, sometimes deliberately opposite to desire (evoking fear) search **who is doing this fro what reason?**

SESTI – Alert-Early warning signals

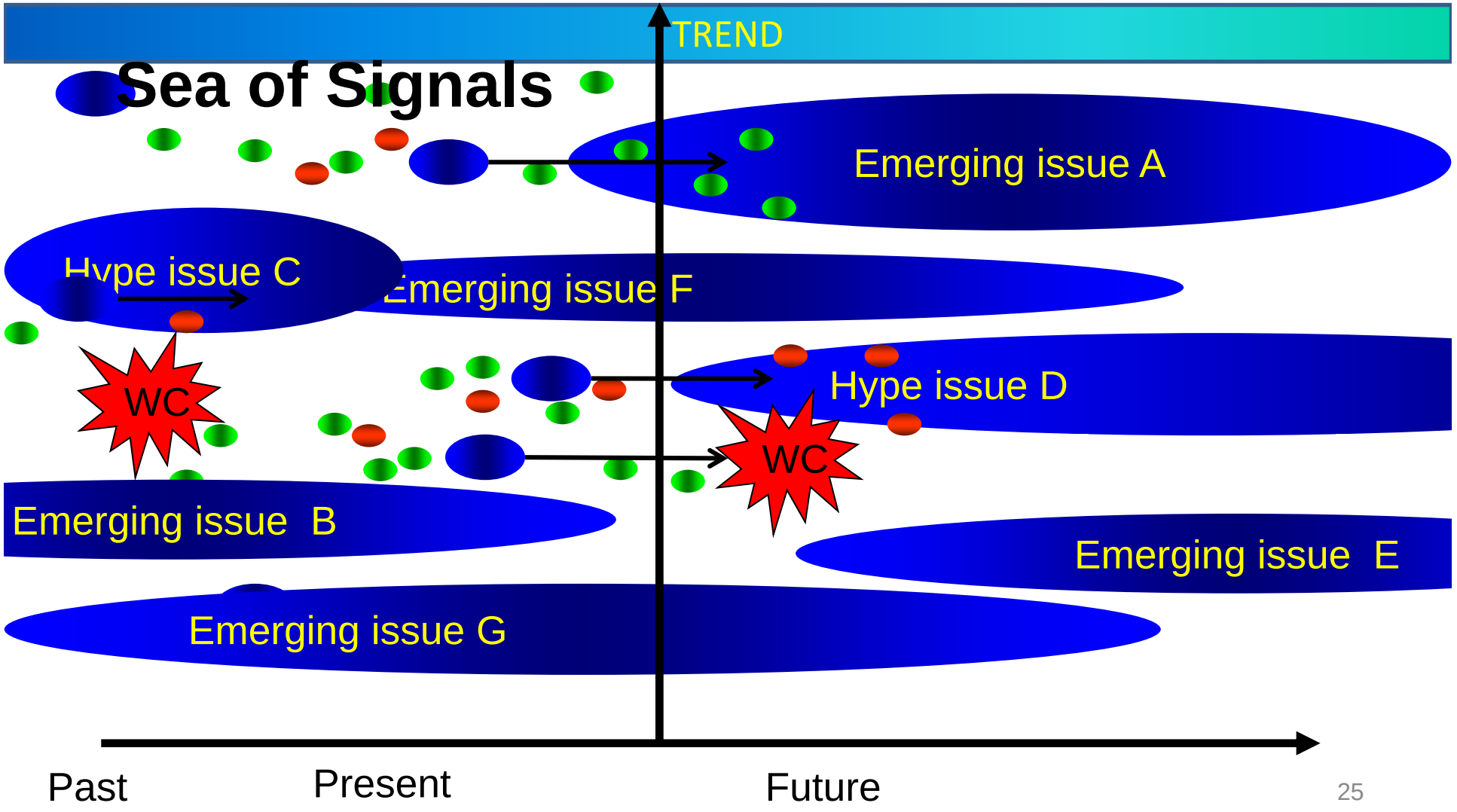
- Primary signal : someone pushes or asks for attention by placing (scientific) article(s) or video's with more or less full description of a wild cards (large breakthrough, opportunity, threat, sniping dangerous trends usually with large impact and even policy suggestions)

- Secundary signals: opposing or confirming (scientific) articles , reactions, discussion with arguments and links (blogs),

_____-

Who is signalling for what reason!!!

SESTI Thinking model



Where to look (systematically)

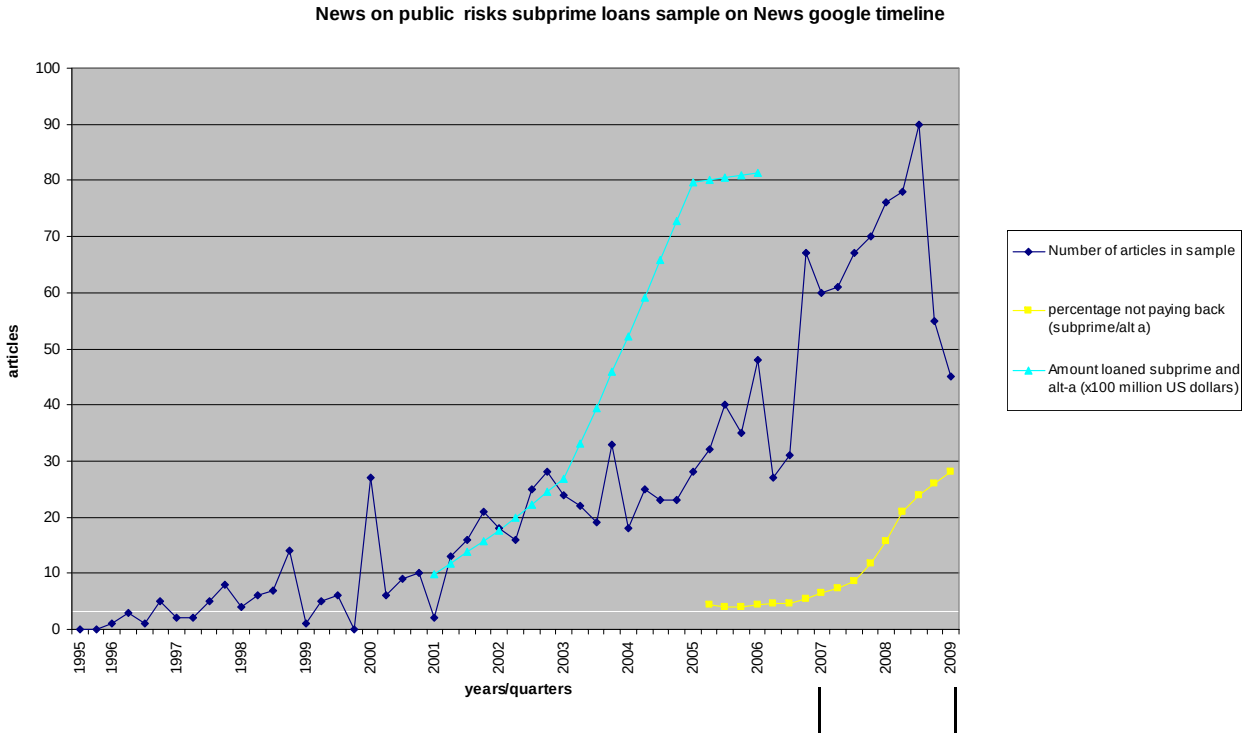
NATURAL CAUSES **ENVIRONMENT**

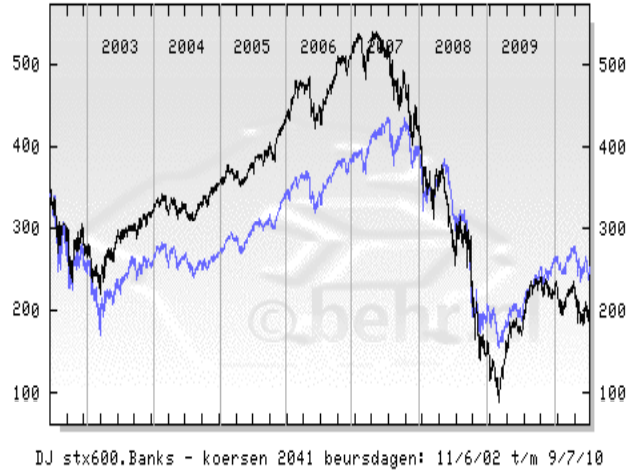
- Earth, land (volcano's, landslides, gas eruption, mud volcano's,earth quakes)
- Air (climate change, dust, tornado, storms)
- Water (draught, floods , pollution natural causes)
- Biosphere (epidemics, plagues, zoo-noses, mass-starvation, infertility etc)
- Outer space (asteroids, extraterrestrial live, no or sudden solar activity)

HUMAN CAUSES **SOCIETY/VALUES** **TECHNOLOGY and SCIENCE** **ECONOMY** **POLITICS/PUBLIC SERVICES**

- Society (Value shifts, movements , hypes social trends, demography,social conflict)
- Technology and Science (breakthrough's, new technologies etc)
- Economy (crisis, prosperous developments etc)
- Politics/Public services (everything that can go wrong and right, warfare)

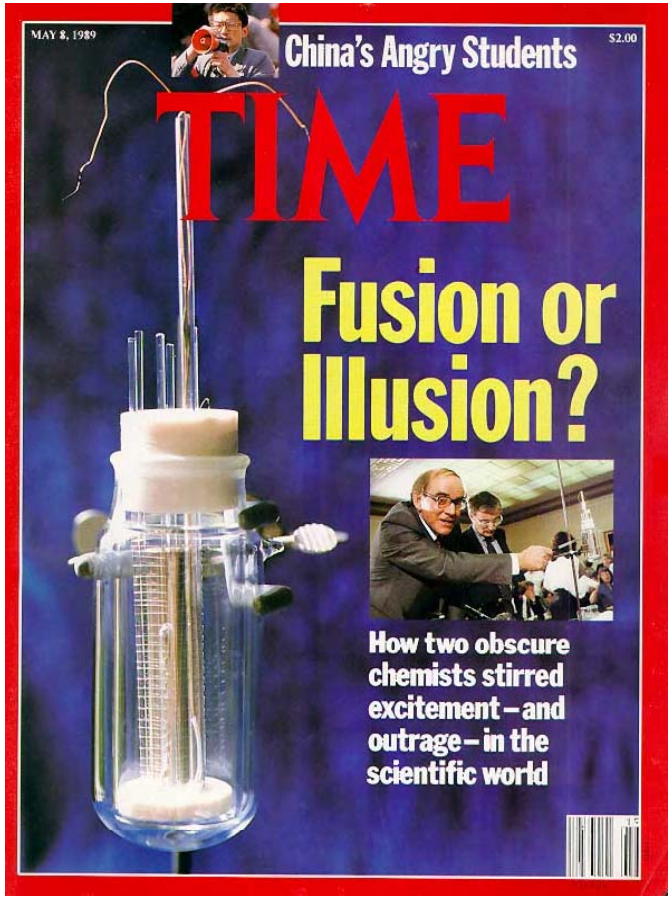
Example 1 missed alert cards





Financial crisis 2007-2008

Example 2 alert card: Very cheap and abundant "clean" energy



Rossi's 1 MW Cold Fusion E-Cat Reactor

Test on 28th of October 2011

awt Adviesraad voor het Wetenschaps- en Technologiebeleid

Low temperature Nuclear Fusion without radiation

- Recent developments indicate that clean "nuclear fusion" will be available within the coming decade without the special and expensive requirements that were foreseen in the Nuclear fusion Inertial confinement and plasma fusion projects (like ITER and NIF) that still need 40 to 50 years before any application.
- After the scientific community felt over the announcement of Fleischman and Pons that they had discovered a simple way to create cold fusion, no one considered to put his career at stake by retrying the experiments that many already tried before in vain
- The contradiction of "low temperature induced" nuclear fusion with many basic findings of nuclear physics and the bad reproducibility of the experiments, caused an almost complete "forbidden"area of science.
- Still some groups went on , amongst them the SPAWAR lab and later on other, gradually creating more reproducible "anomalous" results, leading to a strong interest of US military in 2006 and renewed attention of NASA in 2009 and finally the claim of an Italian that he can create energy form hydrogen and nickel in 2010

Signals

- P1. In 2004 cold fusion was mentioned in the Dutch horizon scan (continuous stream of underground results with anomalous heat – SPAWAR reports(2002)
- S1.Increasing number of a variety of experiments in different countries (with other cathodes, gas in stead of liquid environment, anomalous heat but also transmutation of elements, Iwamuri , Mitsubishu) – hiding under LNER, CANR
- S2.American chemical society and American Physical society start to put cold fusion results on the agenda of their regular worskhops
- S3.+8 Interest of the Military in US (nov 2009 Defence Analysis Report, 12 dec 2006 DTRA workshop)
- S4. Japanese public demonstration of excess heat electrolytic device
- S5.Italian nickel-hydrogen gas device, Focardi/Piantelli claims high repeatable anomalous heat output (2005) , test CERN (unclear outcome), test NASA (confirms anomalous heat)
- P 2 2010 Josephson (former Nobel prize winner) and Bushnell (science director) at NASA speak out the expectation that cold fusion will revolutionizethe energy domain
- Both seeing theory of Widom and Larsen as hypotheses that may fit within the slowly evolving nuclear physics paradigm
- S7. Rossi claims his 1 megawatt test after public demonstrations of 4 – 12 kilo watt devices (based on Focardi device)

Impact

- Nuclear fission and fusion require far less material than the burning of fossil-fuel approximately 370 gram of fissioned Uranium equals 1200 Ton of Charcoal, which equals the nuclear fusion of 100 gram deuterium and tritium.
- As known nuclear fission needs an outstanding High technological performance as well as a much demanding safety and security. Ignition of a controlled nuclear fusion process requires not only very high temperatures but also very sophisticated methods to stabilise the process. Nuclear waste, accidents and proliferation of nuclear arms are known disadvantages of the nuclear fission pathway to resolve the energy problems of the world.
- Rossi claims to control a nuclear fusion process (of Nickel and hydrogen creating Copper) that is much more simple to initiate than “hot”’fusion like ITER and NIFF (with realtive low temperature) – in which 1 kg of nickel and 17 gram of hydrogen produce 1 megawatt heat a year , which is tranformed into steam.

IMPACT ,hard to believe(2)

- Small and large units (back to steam engines) , steam output is usefull for heating, kinetic energy and electricity production , water may be a limiting problem for small mobile applications
- Unbelief will stay for a while
- Enormous shift in energy global production, total disruption, but much quicker to CO2 reduction .Threat to projects as ITER, but also for renewable developers and investors as well as fossil energy investors
- Shifts in power of energy producers (companies , countries)
- Many new questions for Physics (can the paradigm hold)
- Conflicts on patents
- Search for safety and environmental risk

Example 3 Inspiring card: Rebalancing the greenhouse- by re-greening earth & enhancing the carbon cycle

- **WW policy** Expanding and enhance the green space for energy, food, carbon products and sequestration
- Using desert land to catch the sun through irrigation (in DESERTEC like arrangements or by salt water use(tallophytes or cyanobacteria) or even artificial vegetation (start with PV heath solar end with biomass increase)
- Improve the efficiency of total photo synthetic production of natual vegetation , forest and agricultural areas (by ecomanagement, crop selection , biotechnology - C4 plants)
- Further future : development of artificial photosynthesis to sequestrate Carbon and to produce fuel

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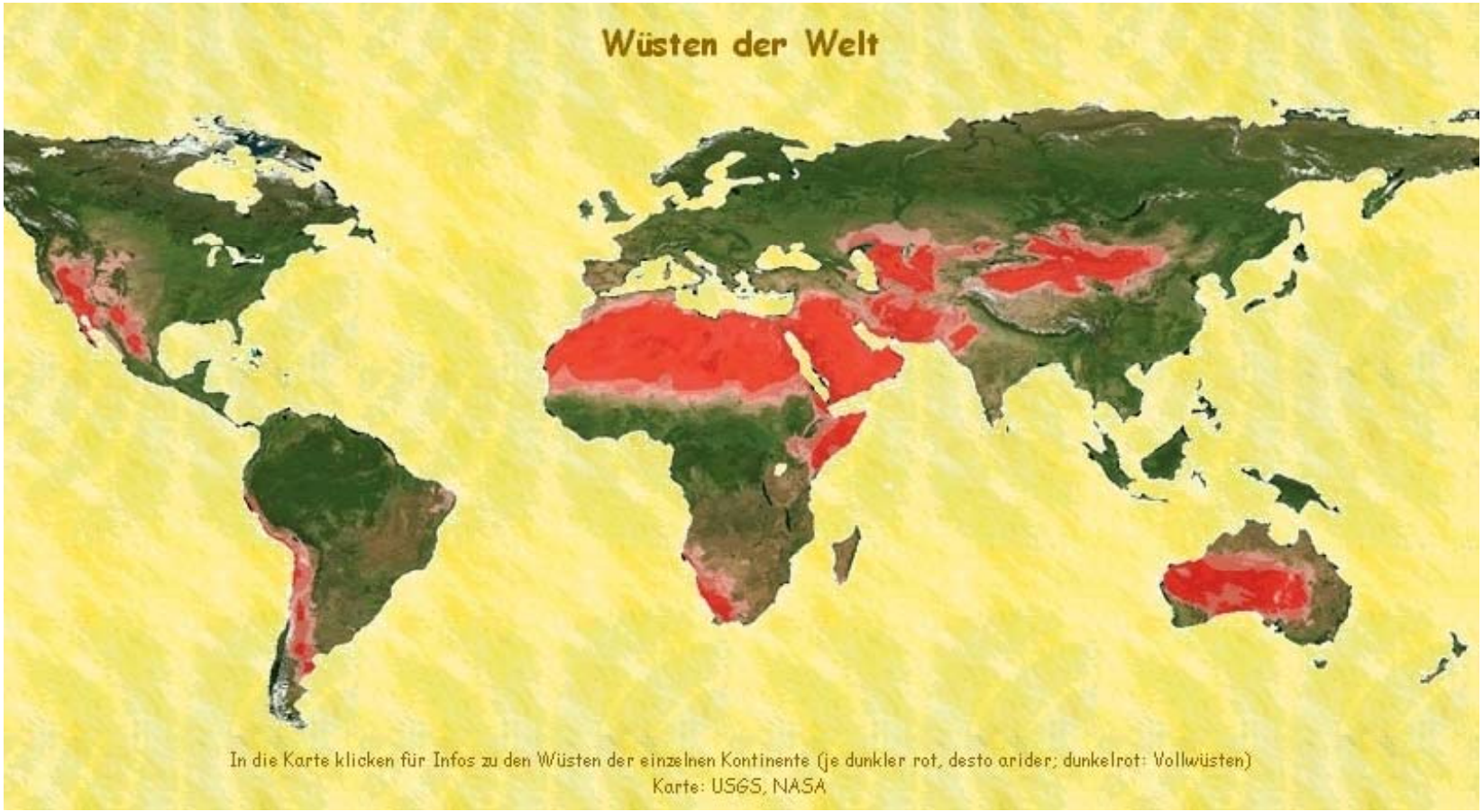
Increase of photosynthesis
20 % of the land is desert



http://emden-weinert.de/Namibia/intro.htm

Most of the land is not very productive

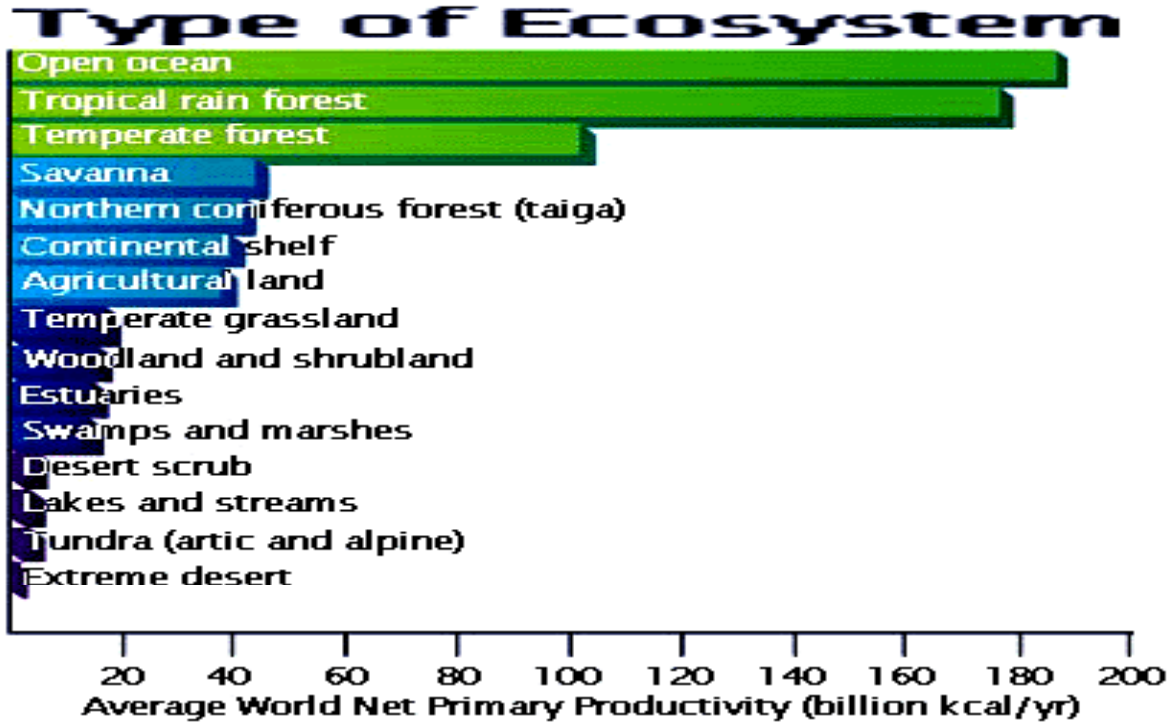
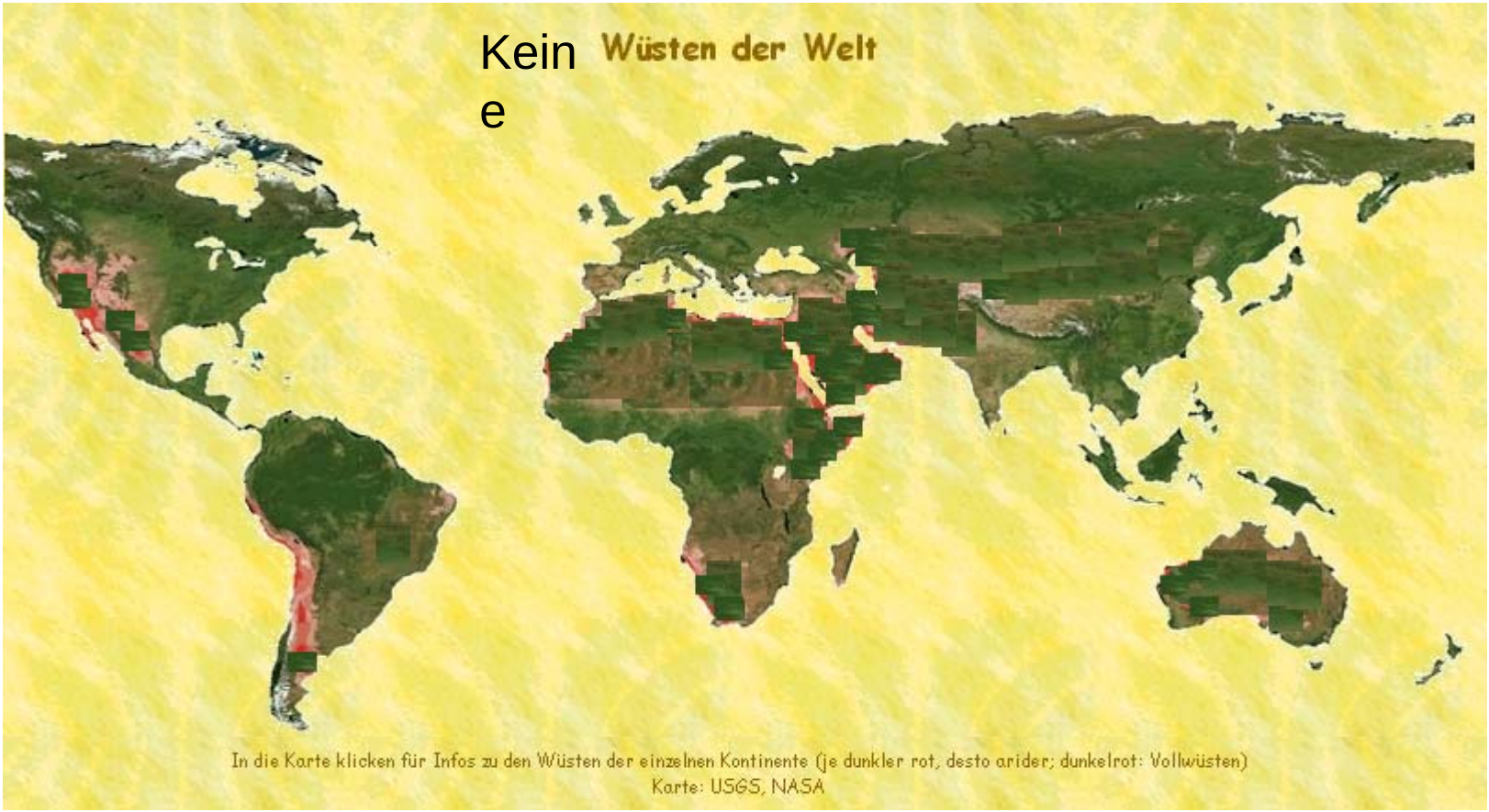
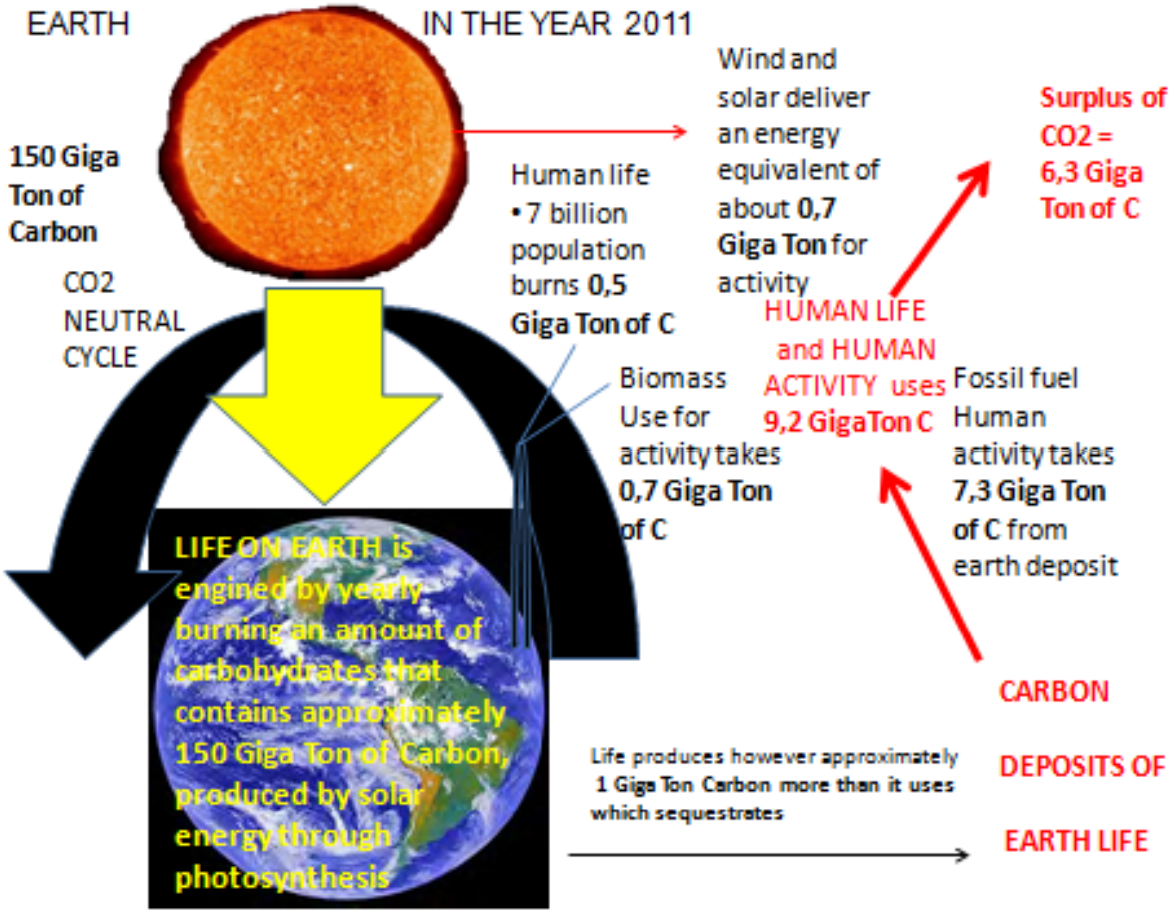


Figure 5. Average world net primary production of various ecosystems.

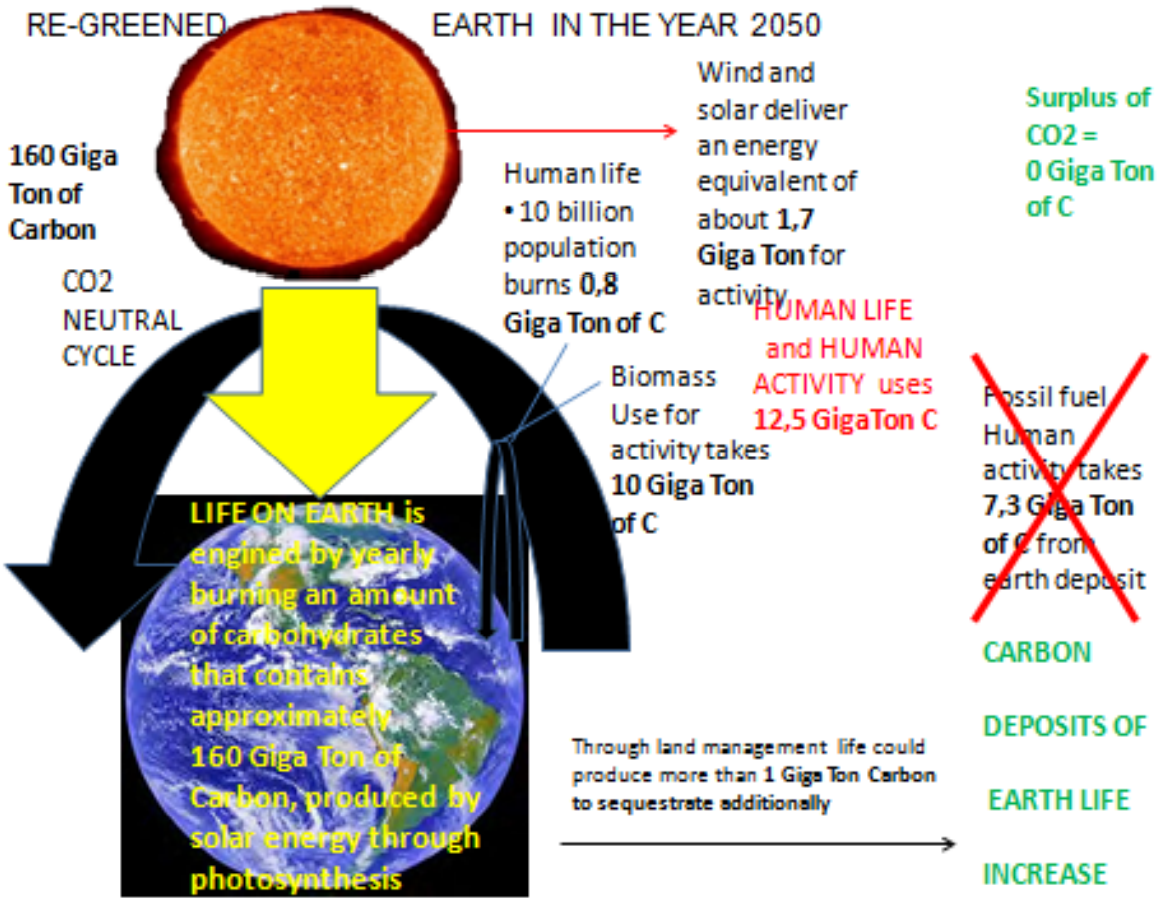
Re-greening the earth



The solar fueled-carboncycle 2011



Re-greened earth – 10 Giga Ton extra will do



The signals

- p1. Biomimics articles , the ideal solar cells transforms sunlight into fuel, based on imitation of biological systems
- p2. Desertec using desertland (in North Africa) to create electricity through solar powerplants – creating agricultural conditions and exporting electricity with High Voltage DC technique to Europe at the same time
- s3. Articles on Artificial photosynthesis to sequestrate and to make fuel
- s4. Articles on biotech improving photosynthetic efficiency in crops and efficienvy competition of plants and PV cells
- s5. NASA brainstorm (use tallophyta and salt water cyanobacteria culture on land to prodcuce energy)
- S6. US-Forestry techniques to sequestrate more carbon/Germany wooden mills

Impacts

- Almost no need for materials that may be scarce or polluting
- Nearly sustainable, local and central energy provisions possible gradual sequestration of atmospheric overdose of CO2
- Land use (countries have different expanding possibilities), agricultural and forestry policy (is also about energy) , carbon pricing
- Fuel versus electricity (competition or cohesion between “bio” and other “tech”) – artificial still long time to go
- Possible loss of Biodiversity (Desert land species)
- Nutrient cycle stress, earth radiance balance

Increase of photosynthesis other aspects

- Concentrated inter disciplinary research needed to increase photosynthetic activity in existing eco-agricultural production and in non productive areas (deserts)
- Spatial planning focus on food an energy
- Research to sequestration balances
- Need for thought on type of fuel (ethanol, hydrogen?), planning of land use
- Line of thought to produce energy with CO2 sequestrated material deserves more attention (wooden mills)

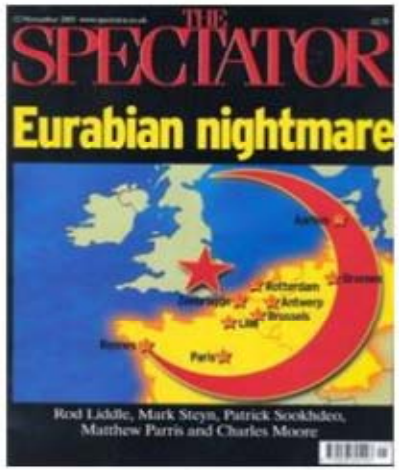
Example 4: The use of wild cards to influence futures in a negative way

Propaganda card (1935)

The Nazi's gave the prevision of a Jewish / free masonry conspiracy causing uproar throughout Europe to obtain Jewish domination of Europe

Source: no64 in the serie "Erblehre und rassenkunde" published by the Verlag fur NAtionale lietartur, Stuttgart, 1935

POLITICS/PUBLIC SERVICES



Propaganda card (2005)

Right wing politicians give the prevision of Islamic domination of Europe, initiated by riots and terrorism, an article in the spectator (november2005) visiualises the pre-vision

POLITICS/PUBLIC SERVICES

Example 4: The use of wild cards to influence futures in a positive way

Boost for innovation Desertec

The Desertec consortium succeeded to combine technological innovation on renewable energy with improved geopolitical and economical relationships on the N-S axis. Energy comes from North Africa while high valued carbon hydrate material comes from Russia

http://www.desertec.org/

SOCIETY

Warning and option cards

Nuclear conflict

The UN could not handle it anymore , practically all the upcoming economies had nuclear power plants and more and more were secretly developing their nuclear arms. Than, what was predictable happened. When the smoke disappeared large territories in Europe, Middle East and Asia were radioactively contaminated (Σ 166)

POLITICS/PUBLIC SERVICES

Search for our cognitive genes

Continuous genetic research on the cognitive genes that distinguish us from apes and other higher mammalians lead to the escape of a highly intelligent cat observed as taxi driver in the city of NY. A new congress committee now has abandoned this kind of research (Σ 485 - Σ 444 - Σ 485)

TECHNOLOGY and SCIENCE

New coalitions

ERUANA

The European-Russian Alliance with North Africa was not what analysts expected in 2010, but was after all a logic consequence of the US dollar debt forced alliance between US and China and the continuous turmoil in middle East and Africa (Σ 413)

POLITICS/PUBLIC SERVICES

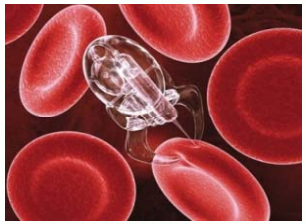
Lobby cards (give me the funding)

Artificial life???

Artificial life

After the copy of a genome microbe by “Venter” claimed the creation of artificial life. A renewed attention was given to really understanding the development of cells and the complex interaction of genomes with the cell (hard ware) interior environment

TECHNOLOGY and SCIENCE



Nano saves our lives
Bioinspired nanotechnology creates nano - vehicles for targeted drugs application and diagnosis. We will be able to cure cancer?

TECHNOLOGY and SCIENCE

Conclusion 1

- Imaginary wild cards and imaginative wild cards as well as emerging issues are important elements in envisioning the future and to create more resilient strategy.

- Horizon scanning focuses on the continuous identification of the most impact rich ones and tries to raise awareness of policy makers and researchers to provide appropriate actions,

- Difficulties are the complexity (interactions of issues wild cards etc) and the barriers for issues and wild cards that people do not want to see but need to see

- Human initiated wild cards may be based on ideologies, particular interests, fears or hopes and should always be assessed very critically

Conclusion 2

- Imaginary wild cards and imaginative wild cards can be used to test strategies and policies on robustness but also to envision new option for existing challenges.

- Envisioning what “”may be”” and what we would like “’to be there in the future”” is a very important aspect of foresight that goes beyond forecasting and planning

- However it should be connected with what we got o find how to get there