



The Foresight Company

# Dark Scenarios Like In Science Fiction — The FESTOS Experience

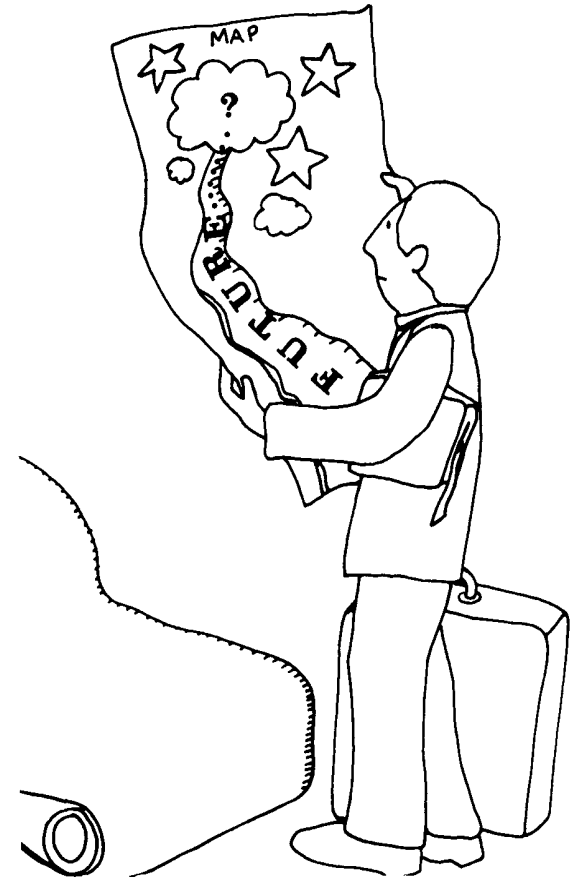
**Dr. Karlheinz Steinmüller**

11 June 2015,  
**Turku / Finland**

**World Conference of Futures Research 2015:  
Futures Studies Tackling Wicked Problems:  
Where Futures Research, Education and Action Meet**

# Overview

- Looking Back
- Dark Scenarios
- FESTOS
- Conclusion



# Comets – Signs of the Future

A Blazing Star,  
Threatens the World with Famine, Plague  
and War;  
To Princes, death; to Kingdoms many  
crosses;  
To all Estates, inevitable Losses;  
To Herdmen, Rot; to Ploughmen, hapless  
Seasons;  
To Sailors, Storms; to Cities, civil  
Treasons.

Guillaume Du Bartas (1544-1590):  
*La Semaine ou création du Monde* (1578)

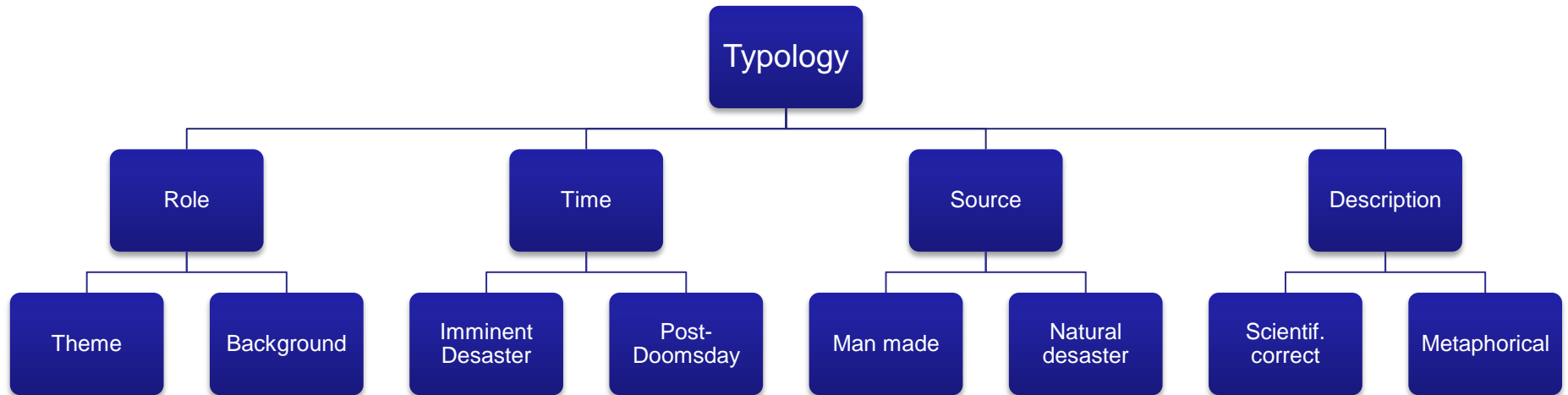


What are our “comets”?

# Examples: Science Fiction Movies

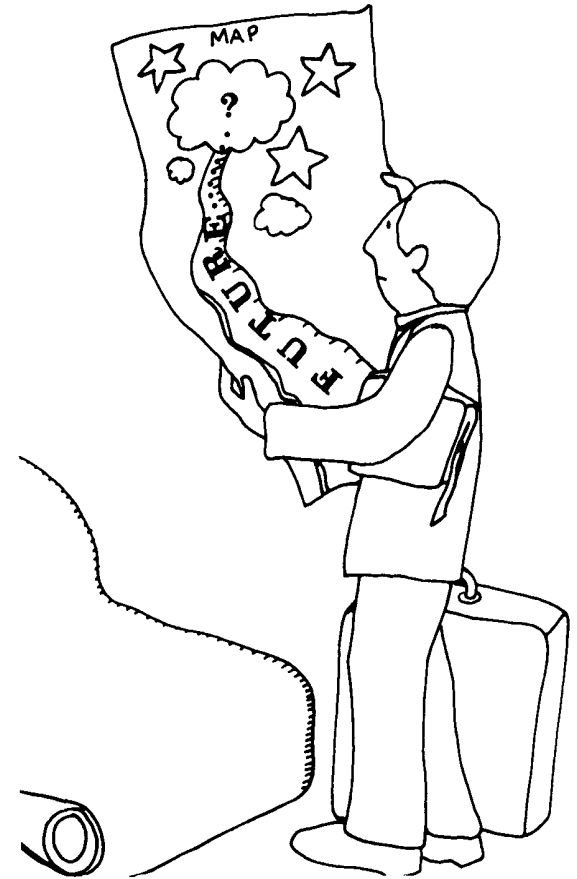


# Types of Dark (Fictional) Scenarios

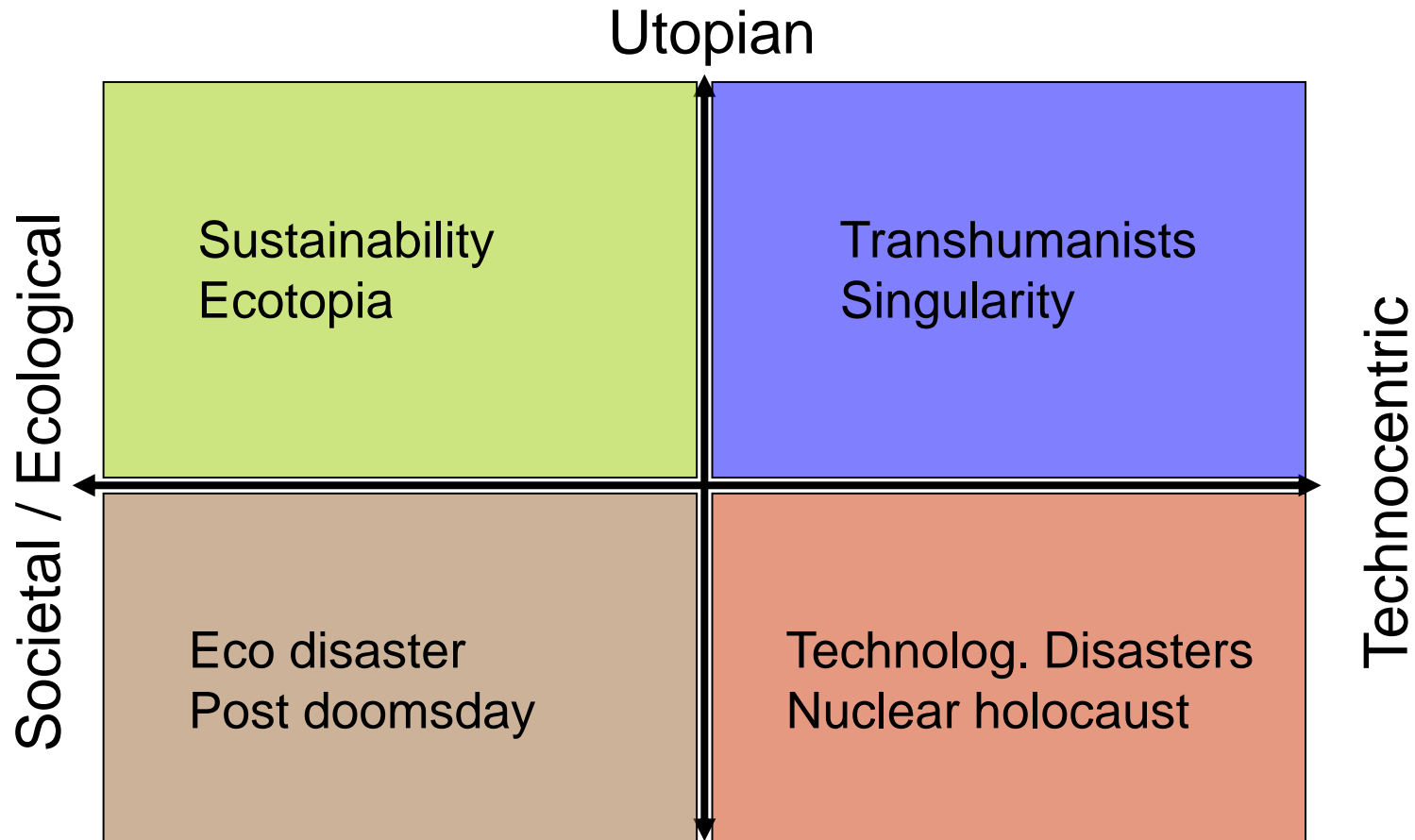


# Overview

- Looking Back
- Dark Scenarios
- FESTOS
- Conclusion



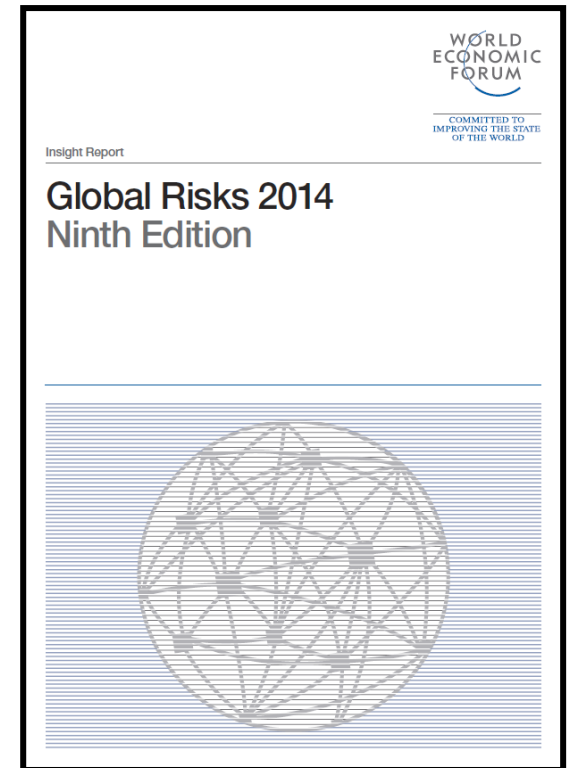
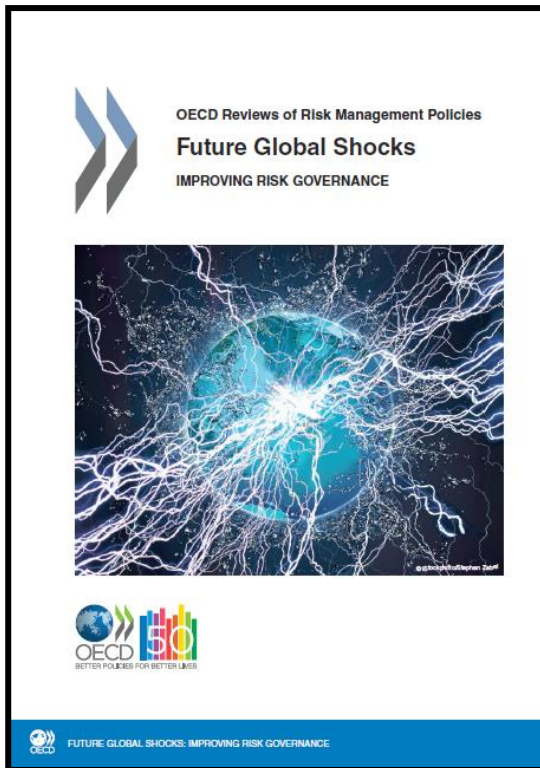
# The Four Quadrants of Futures Thinking



Attn.: Skeptics out of scope

Apocalyptic

# Increasing Attention to Risks...





# ... and Vulnerabilities

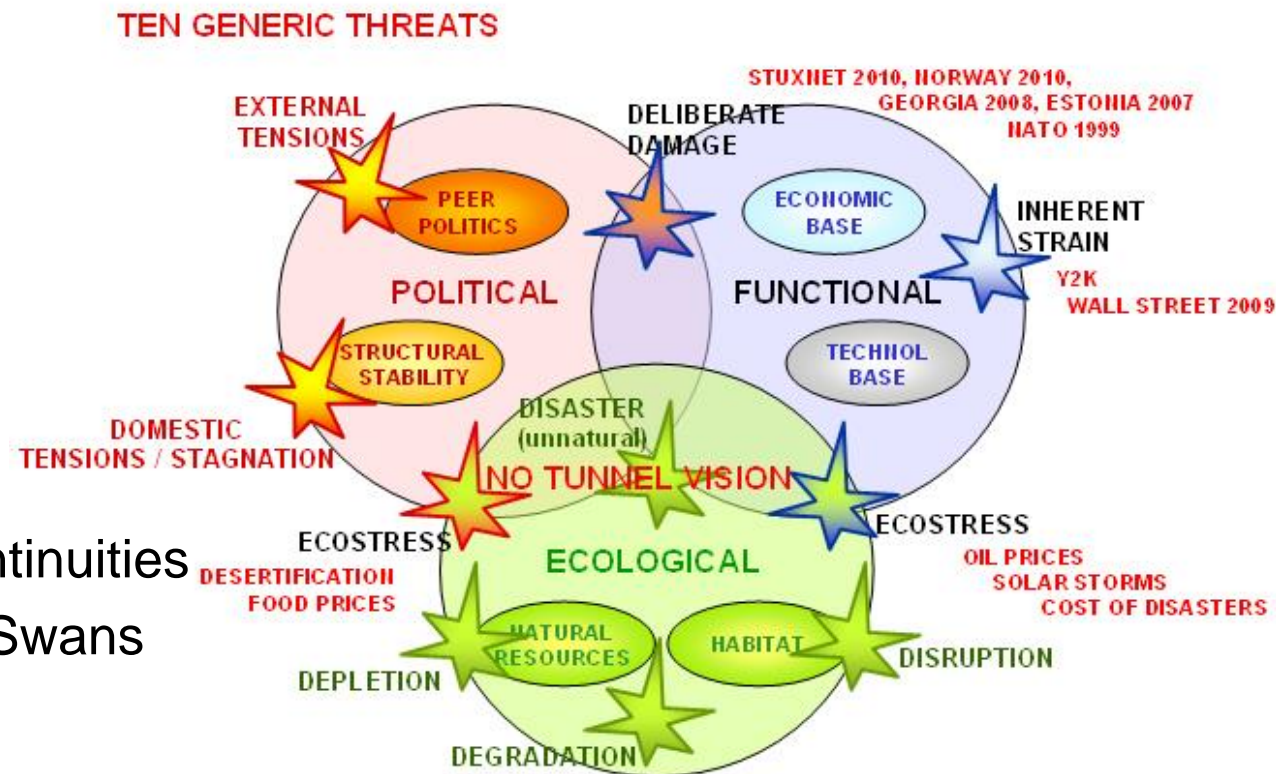
## VUCA World:

- Volatility
- Uncertainty
- Complexity
- Ambiguity

- Risks & Threats
- Disruptions & Discontinuities
- Wild Cards & Black Swans

### WHAT ARE THE THREATS?

Tomas Ries – ISS / FHS

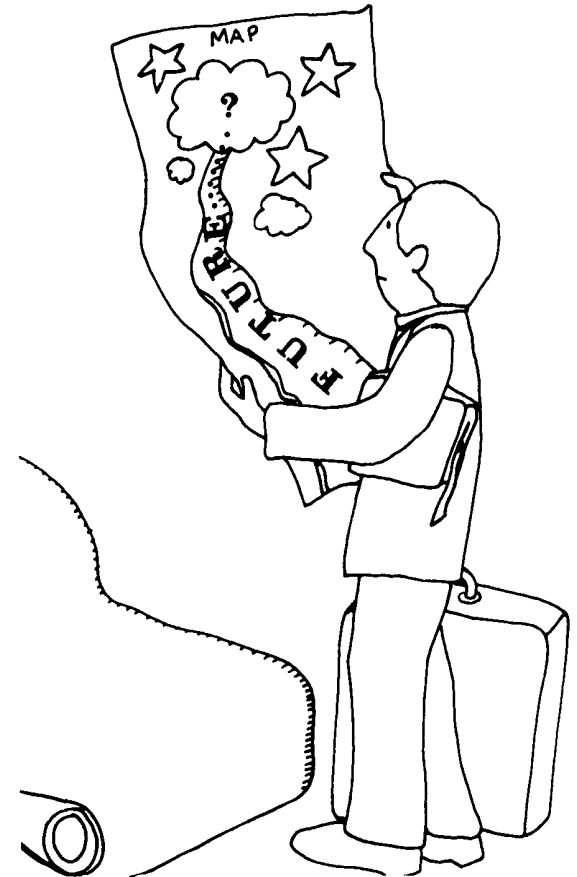


# Dark Scenarios Are Realistic



# Overview

- Looking Back
- Dark Scenarios
- **FESTOS**
- Conclusion



# Project FESTOS



<b>Project</b>	<b>Foresight of Evolving Security Threats Posed by Emerging Technologies</b>
Client	EU – FP7
Duration	2010 – 2012
Approach	Surveys narrative scenarios Expert workshop
Outcome	Description of technologies and threats 4 scenarios
Dissemination	Report Book (in prep.)

## FESTOS NEWSLETTER

*Foresight of Evolving Security Threats Posed by Emerging Technologies* Feb 2011  
 The FESTOS project is co-funded by the European Commission - www.FESTOS.org Issue 2

---

**Coordinator's Introduction**

By Yair Sharan

The FESTOS project has now completed its second year of activity. The last two years have been full of activities accomplishing many research objectives and sharing results with experts and colleagues in a series of workshops and conferences. The FESTOS research team has had the opportunity to dive into a huge sea of new knowledge in many S&T areas from Nanotechnology, Robotics and New Materials to Informatics and Biotechnologies. FESTOS succeeded completion of a world wide expert survey involving scientists and technologists from various fields to help assess what we term as the "dark side" of technology – the abuse potential of future technologies by vicious groups who aim to threaten society.

Yair Sharan

This process resulted in likelihoods and levels of severity of various potential technological threats as well as possible scenarios in which these threats might be realized. You might thus find interest in some of the FESTOS results presented in this newsletter and find out more information by reading the FESTOS reports.

FESTOS also benefits from the active participation of its advisory security board whose members contributed to this publication too. Last but not least FESTOS has succeeded to cooperate with many other EU projects sharing with them expertise and results, and has benefited a lot from its mutual relations with projects like SANDERA and iKnow.

We are now approaching the last phase of this fascinating study which will include a series of workshops and conferences in which FESTOS will present its results and accomplishments.

**In this newsletter**

- Editorial.....2
- FESTOS International Advisory Board.....3
- FESTOS Objectives.....3
- Articles:
  - The Implications of Technology Terrorism.....4
  - Security Climates in the FESTOS Project.....5
  - Synergies and Interactions Between FESTOS and SANDERA.....6
  - The Scenario-Workshop in FESTOS.....7
  - FESTOS Example Scenario: Cyber-Insects attack!.....8
  - Turku Conference.....9
  - Adapting Police Work to Technological Developments.....10
  - Potential Misuse of Emerging Technologies: FESTOS Expert Survey.....11
- Events.....12-13
- News.....13

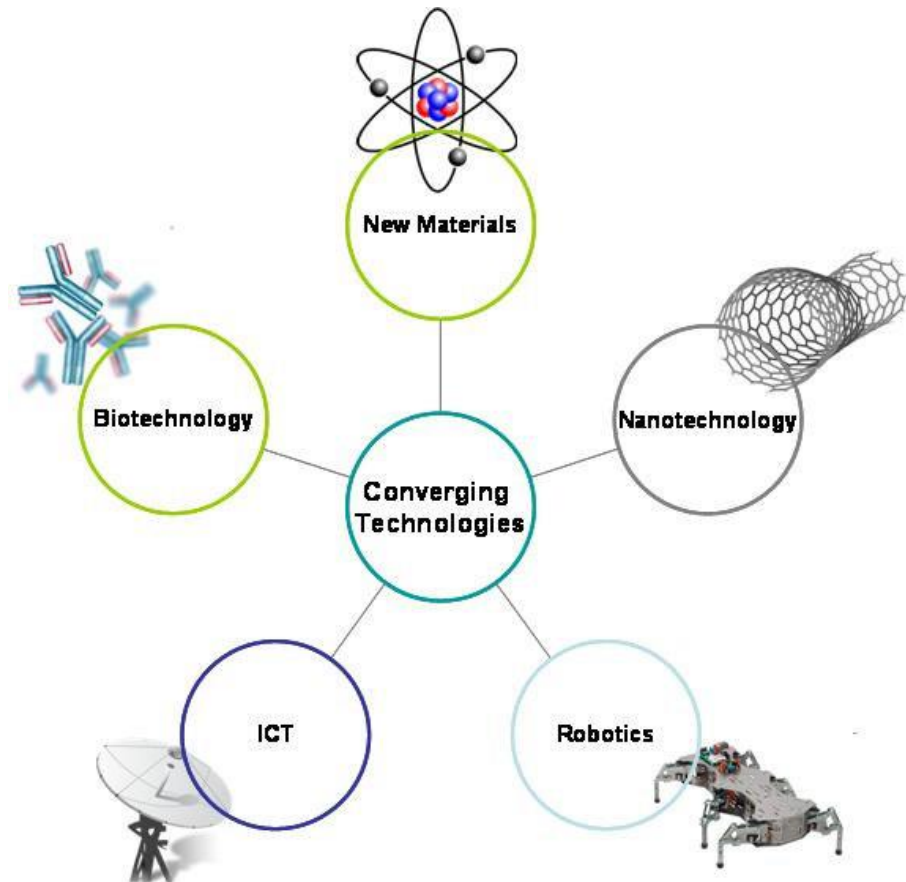
"The future always arrives too fast...and in the wrong order" - Alvin Toffler

# FESTOS: Aims

Raise awareness and initiate debate about the possible “dark sides” of future technologies.

Three pillars:

- identify new, potentially threatening technologies
- assess emerging threats and construct scenarios
- draft preparatory measures and policy guidelines



"Unless we invent new threats, we won't be able to prevent them."



# FESTOS: Some Outcomes

## Ten New Top Priority Threats

1. Smart mobile phone mash-ups
2. Internet of things (IoT)
3. Cloud computing
4. New gene transfer technologies
5. Advanced artificial intelligence
6. Synthetic biology
7. Cyborg insects
8. Energetic nanomaterials
9. Radio-frequency identification (RFID)
10. Autonomous & semi-autonomous mini robots

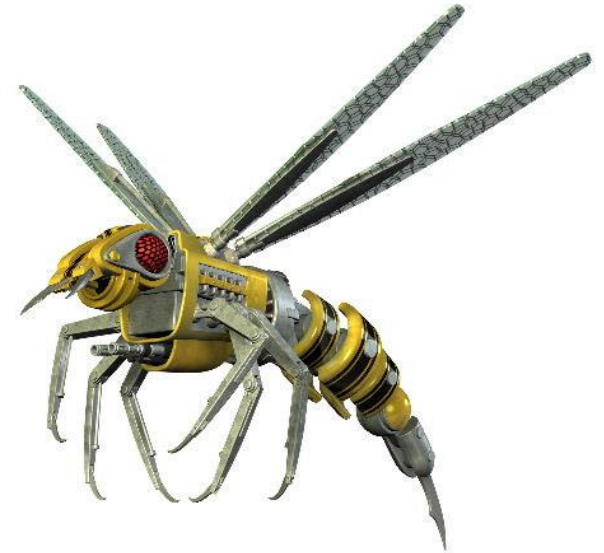
- **Awareness** of potential security threats of specific new technologies.
- **Initiation of a foresight process** in Europe that continuously scans the unfolding technology landscape in anticipation of evolving threats.
- **Alternative scenarios** that outline future impacts of security threats with special attention to low likelihood but high impact events.
- Identification of "**early warning signals**" that might hint at the growing likelihood of unforeseen scenarios.
- **Policy guidelines** aiming at novel means of preparedness for future threats.

# FESTOS: The Scenarios

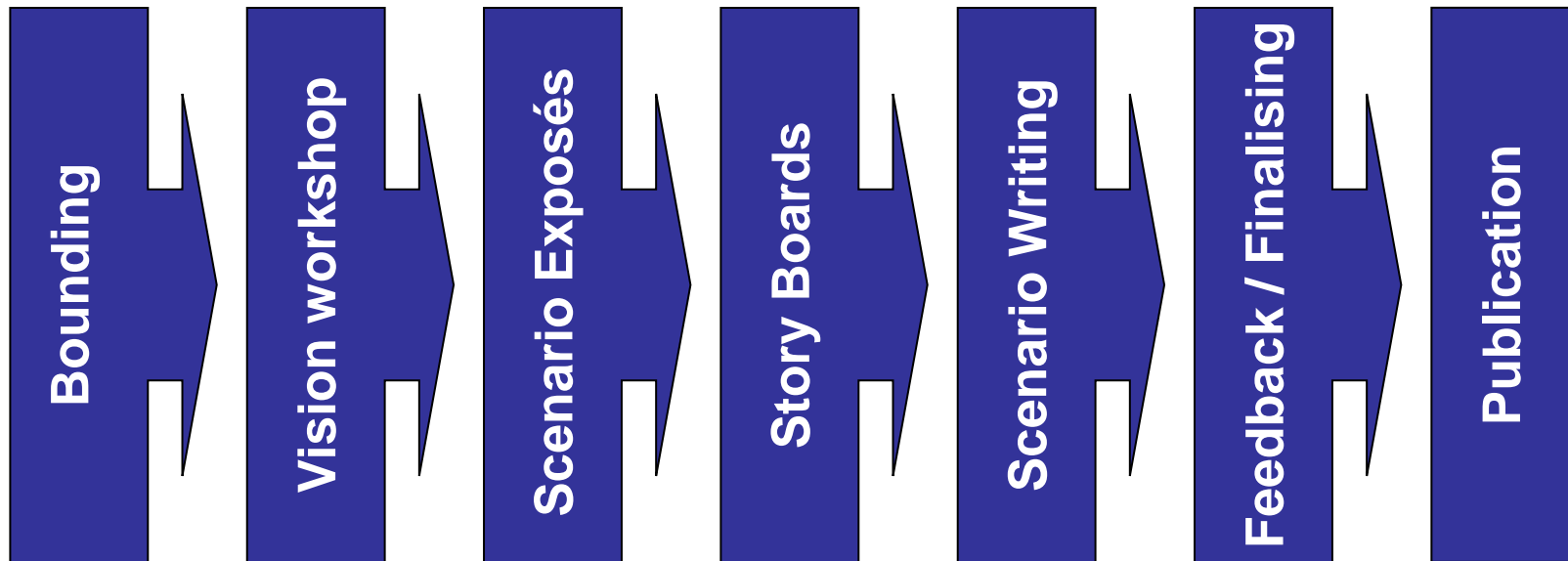


## “The Dark Side of Technology”

- *Scenario 1: Cyber-Insects Attack!*  
Swarms of artificial bees attack men and cattle.
- *Scenario 2: The Genetic Blackmailers*  
Individual DNA is abused to blackmail a politician.
- *Scenario 3: At the Flea Market*  
Intelligent nano-based household appliances self-destruct in reaction to a wireless signal.
- *Scenario 4: We'll Change Your Mind...*  
Terrorists use a “virus” to influence the behaviour of a regional population with the aim to change votes.



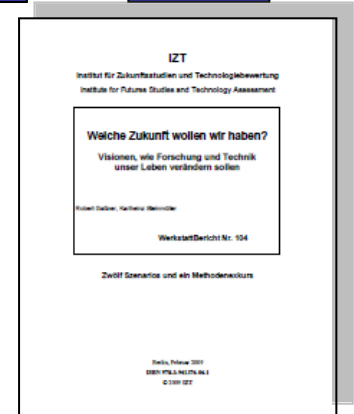
# The Way to the Scenarios



Gaßner, R. / Steinmüller, K.: Scenarios That Tell a Story (2004)

<http://foresight.jrc.ec.europa.eu/fta/papers/Papers%20from%20posters/Scenarios%20that%20tell%20a%20story.pdf>

Welche Zukunft wollen wir haben? Visionen, wie Forschung und Technik unser Leben verändern sollen. Zwölf Szenarios und ein Methodenexkurs, IZT-Werkstattbericht 104, Berlin 2009





# Writing Narrative Scenarios – Like SF

## Plot Line:

### Story Telling

- Plausible and dramatic plot
- Convincing characters
- Convincing interaction / unfolding of action
  
- Intriguing beginning
- Arc of suspense
- Pointed ending

## Idea Line:

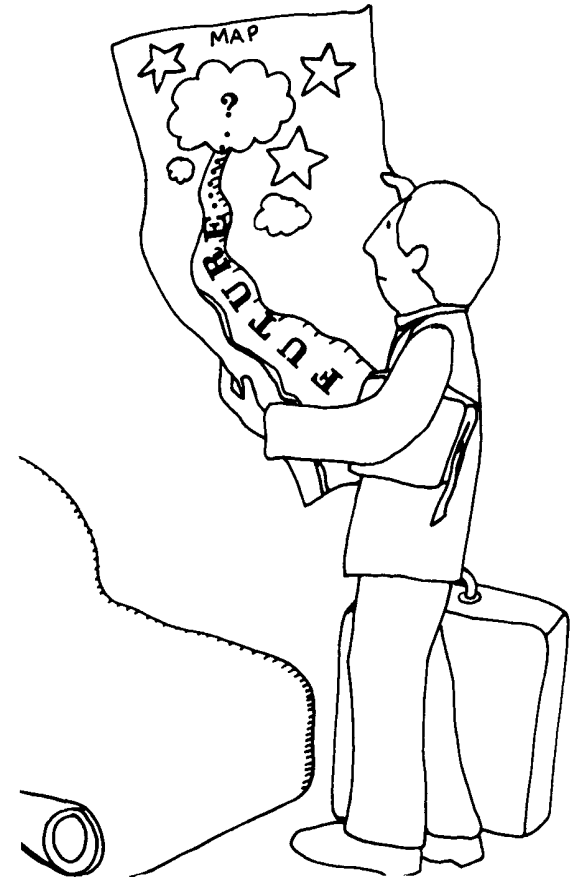
### Communicating Content

- Integration of all relevant ideas / visions
- Bargain between abstract concepts and specific details
- Tangible descriptions
- No overload, no unnecessary decorations or side-ideas

There is always a tension between plot line and idea line.

# Overview

- Looking Back
- Dark Scenarios
- FESTOS
- Conclusion



# Science Fiction vs. Foresight

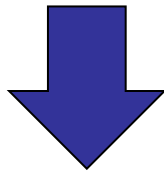
	Science Fiction	Foresight
<b>Aim</b>	<ul style="list-style-type: none"><li>• entertainment</li></ul>	<ul style="list-style-type: none"><li>• decision making</li></ul>
<b>Approach</b>	<ul style="list-style-type: none"><li>• intuitive &amp; creative</li><li>• (but also with method)</li></ul>	<ul style="list-style-type: none"><li>• methodological</li><li>• (but also with creativity)</li></ul>
<b>Guiding questions</b>	<ul style="list-style-type: none"><li>• What is imaginable?</li><li>• What is the most surprising, striking, terrific that can happen?</li></ul>	<ul style="list-style-type: none"><li>• What is possible / feasible?</li><li>• What are plausible impacts?</li><li>• What is desirable?</li></ul>
<b>Quality criteria</b>	<ul style="list-style-type: none"><li>• originality</li><li>• strength of imagination</li><li>• narrative (dramatic) quality</li></ul>	<ul style="list-style-type: none"><li>• plausibility, realism</li><li>• methodological transparency (e. g. explicit value statements)</li></ul>

**Has SF the more realistic perception of man and society?**

# Scenarios With an Impact

## Impact

- Mobilizing or demobilizing?
- Fatalistic or proactive?



**Dramatic warning  
But no alarmism!**

## Prerequisites for impact

- Real, pressing problem
- Plausible setting (not necessarily scientifically plausible!)
- Convincing story with inspiring ending
- Lines of action available

# Dark Scenarios: The Cassandra Problem

Cassandra



Jonah



What is better: To be right and nobody believes you?  
To be believed and to be proven wrong?

# A Final Word



## Immanuel Kant:

A “predictive historiography of things to come in the future” is only possible, “if the foreteller himself makes the events happen, that he has predicted in advance.”

*“Renewed Question: Whether the human kind is in steady progress to a better state?” (1789)*

**Action, not prediction matters!**

---

# Thank You For Your Attention!

[www.z-punkt.de](http://www.z-punkt.de)  
[www.steinmueller.eu](http://www.steinmueller.eu)