

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

Problem 1: complexity of Transport & Aerospace markets:

- attempted solution: breakdown of value chains (cf. energy sector):
 - structural systems
 - Drive systems
 - Support systems (comms, control, security, safety, etc.)

Problem 2:

- confidentiality of (significant amount of) data related to defense (in these sectors)
- confidentiality due to limitations of proprietary information (specifically relevant in lengthy supply chains)

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

- Identify and review **current approaches** to assessing economic impact of nanotechnology. What are their **limitations**? Are they **broadly applicable**? Are there **sufficient data** available?

Current approaches and their limitations:

- R&D funding (in part into academia) <> academic output lacks economic impact if not connected to industry R&D
- No. of (academic) publications <> academic output lacks economic impact if not connected to industry R&D
- No. of patents <> majority of patents remains unused (possible solution (as used by industry): follow patent-developments according to a filter of significance)
- Job counts <> lack of distinction between newly created and replacement jobs
- Company count <>
 - sudden bankruptcy of companies (counts need to be repeated on company-specific level to show dynamics)
 - Identification of the right companies to count in the first place (possible solution: count companies that are USING/INTRODUCE nanotechnologies in one way or another!?)

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

- Identify and review **current approaches** to assessing economic impact of nanotechnology. What are their **limitations**? Are they **broadly applicable**? Are there **sufficient data** available?

Are they **broadly applicable**?

- That's part of the problem! (i.e. their usefulness is limited to those aspects that are sector-independent)

Are there **sufficient data** available?

- No, for above mentioned reasons (e.g. complexity, confidentiality, proprietary information, limitations of current approaches)

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

- What is **not currently being captured** by metrics that should be?
 - Assessment of changes/increases in technology-readiness (relying on the ability to quantify 'technology-readiness' with appropriate models)
 - Translation of measurable environmental and health benefits into economic impacts (cf. decrease of carbon footprint, increasing safety, increase in energy efficiency)
 - Number of incidents when nanotechnology was the best-in-class solution to a non-nanospecific problem.
 - Products & services that would NOT exist without nanotechnology (for a similar cost and/or with a similar quality) (e.g. mobile data/energy storage, transistors, flexible displays & solar cells)

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

- What is a **reasonable objective** to set for the economic assessment of the impact of nanotechnology in your sector in **3 or 5 years (too short for aerospace)**?
- Translate & quantify technological impact (e.g. environmental & health benefits) into economic impact (cf. decrease of the cost of a kWh generated by solar cells, enabled by nanotechnology, super-lightweight materials)
- Identify/count products & services that would not exist without nanotechnology

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

Problem 1: complexity of Transport & Aerospace markets:

- attempted solution: breakdown of value chains (cf. energy sector):
- structural systems
- Drive systems
- Support systems (comms, control, security, safety, etc.)

Problem 2: confidentiality of (significant amount of) data related to defense (in these sectors)

- Identify and review **current approaches** to assessing economic impact of nanotechnology. What are their **limitations**? Are they **broadly applicable**? Are there **sufficient data** available?

Current approaches and their limitations:


- R&D funding (in part into academia) <> academic output lacks economic impact if not connected to industry R&D
- No. of (academic) publications <>
- No. of patents <>
- Job counts <>



SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology


BREAKOUT SESSIONS:

 *Nanomedicine* – Auditorium

 *Energy* – Abelson Room

 *Advanced Materials* – Haskins Room

 *Food & Food Packaging* – Revelle Room

 *Transportation & Aerospace* – Cabot Lab

 *Electronics* – Room 207

SESSION 6: Exploring the Quantitative Dimensions of the Economic Impact of Nanotechnology

Coffee Break???

... by discretion of the Breakout Session Co-Chairs

Indicator: 'Attention Level'

Metric: ?