

# **Key Characteristics of Nanotechnology Risk Governance Solutions: International Economic and Environmental Impacts**

Dr Rye Senjen  
FOE Australia, Nanotechnology Project

# **Friends of the Earth – for an environmentally sustainable & just society**

- **The world's largest grassroots environmental network**
- **Decentralized and democratic structure**
- **71 diverse national member groups**
- **Approximately 1.5 million members**
- **Environmental and social issues**
- **We challenge the current model of economic and corporate globalization**

# My background

- **PhD in Artificial Intelligence**
- **15 years experience in the telecommunications industry (application development, application forecasting, strategy)**
- **Active campaigner for social justice for the last 25 years**

# Community backlash against nanotechnology?

## Major sources of backlash

- Lack of true participatory decision making
- Community concerns about lack of regulation, toxicity, economic impact etc. ignored
- Industry benefits, community bears risk
- Increased corporate control
- Greater social marginalisation
- Community values ignored

## Current responses

- Superficial consultation, no participatory decision making
- Community concerns beyond scientific risk are trivialised
- Resistance to precaution-based regulation
- Increased corporate control
- Potential marginalisation ignored
- Ethical problems ignored

**Current responses by government & business  
will ensure backlash!**

# Industry and NGO's views of potential economic problems

## Large scale economic disruption

- Nanomaterials may displace commodity markets
- Disruption to trade relations
- Developing countries most vulnerable
- Growth of nano divide
- Economic disruption from an abundance of cheap products

## Potentially large economic costs

- Irresponsible development
- Differing risk management policies => unfair competition, job losses, inappropriate banking and investment policies
- Insurance losses
- Criminal or terrorist uses

Source: IRCG Surveys on Nanotechnology

# Industry and NGO's views of potential environmental problems

## Risks to humans

- Nanotoxicity: nanoparticles may create long term human health risks

## Risks to the environment

- Nanotoxicity: nanoparticles may create long term environmental risks
  - Ø high mobility, high biological activity, bio-persistence
  - Ø potential to cause ecosystem level negative impacts
- Potential to exacerbate existing environmental problems
  - Ø may encourage greater pollution
  - Ø collective environmental damage from unregulated products

Source: IRCG Surveys on Nanotechnology

# FOE's views of environmental and economic issues relating to nanotechnology

## **Economic Risks**

- Geography, raw materials and labour may become interchangeable
- Platform technology patents pose risks of near monopoly control
- Bias towards large-scale, globally oriented, corporately controlled production
- Technical solutions cannot solve social problems

## **Environmental Risk**

- The deep integration of nature within the industrial system
- Nano-pollution – potential for ecosystem level collapse
- Nanobiotechnology – incalculable risks

# Frame 1/2 are inadequate for most economic risks identified

- Large-scale disruption of commodity markets and trade
- Massive social upheaval due to interchangeability of geography, raw materials & labour
- Economic crises of over consumption
- Near monopoly power over key systems of production
- Significant exacerbation of existing inequities – social, economic

**Concepts of risk, hazards and exposure are unlikely to address any of these problems, yet for communities around the world these are the key issues of concern**

# **Frame 1/2 are partially adequate for environmental risks identified**

**Concepts of risk, hazard and exposure are inadequate to address:**

- Deep integration of nature within industrial production
- Ecosystem level risks from nano-pollution
- Risks of convergent technologies (eg nanobiotechnology)

**Concepts of risk, hazard and exposure may be adequate to address:**

- Some forms of nano-pollution
- Some human health risks associated with nanotoxicity

**But only if a precautionary approach is taken**

# Frame Zero: addressing values issues

## Guiding principals for frame Zero

- Community and environmental interests and values must always come first
- Individual/company interest must come second
- A precautionary approach to managing risk is essential, but not enough to address key community concerns
- We need new mechanisms that allow true civil society participation in decision making

# Key issues to increase community confidence and avoid backlash

- Who gets to decide what our future world looks like?
- Who controls the emerging convergent technologies?
- Whose interests are they being developed in?
- Who benefits?
- Who bears the risks?
- Do the answers meet community needs?

FOE Australia

Nanotechnology project website:  
<http://nano.foe.org.au>

Dr Rye Senjen's email address:  
[rye.senjen@foe.org.au](mailto:rye.senjen@foe.org.au)