

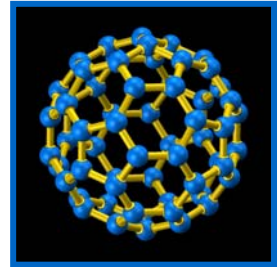
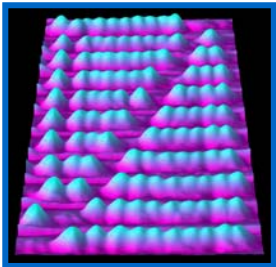


Federal Research on the EHS Implications of Nanotechnology:

Key Management Principles

Presented to:
The National Nanotechnology Coordination Office

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Introduction

- Peter Linquti
 - Recently retired as Executive Vice President, ICF International
 - Now a Consultant to ICF International
 - 23 years experience in environmental policy and economics
 - MPP, University of California at Berkeley
- ICF International
 - Provides consulting services and technology solutions to government and commercial clients
 - Founded in 1969, more than 1,800 employees

Basis of Remarks: ICF's December 2006 Study



- Co-author: Adam Teepe
- Methodology
 - Literature review
 - Stakeholder interviews
- Sponsorship
 - Pro bono work by ICF
 - Contribution to debate
- Relevance to Today
 - Selected highlights
 - Extend certain concepts

Key Finding: Strong Management as Important as Sound Science

- Sound science: Necessary but not sufficient
- Strong management: Aligns scientific research with decision-makers' needs

**Sound Science + Strong Management =
Actionable Knowledge**

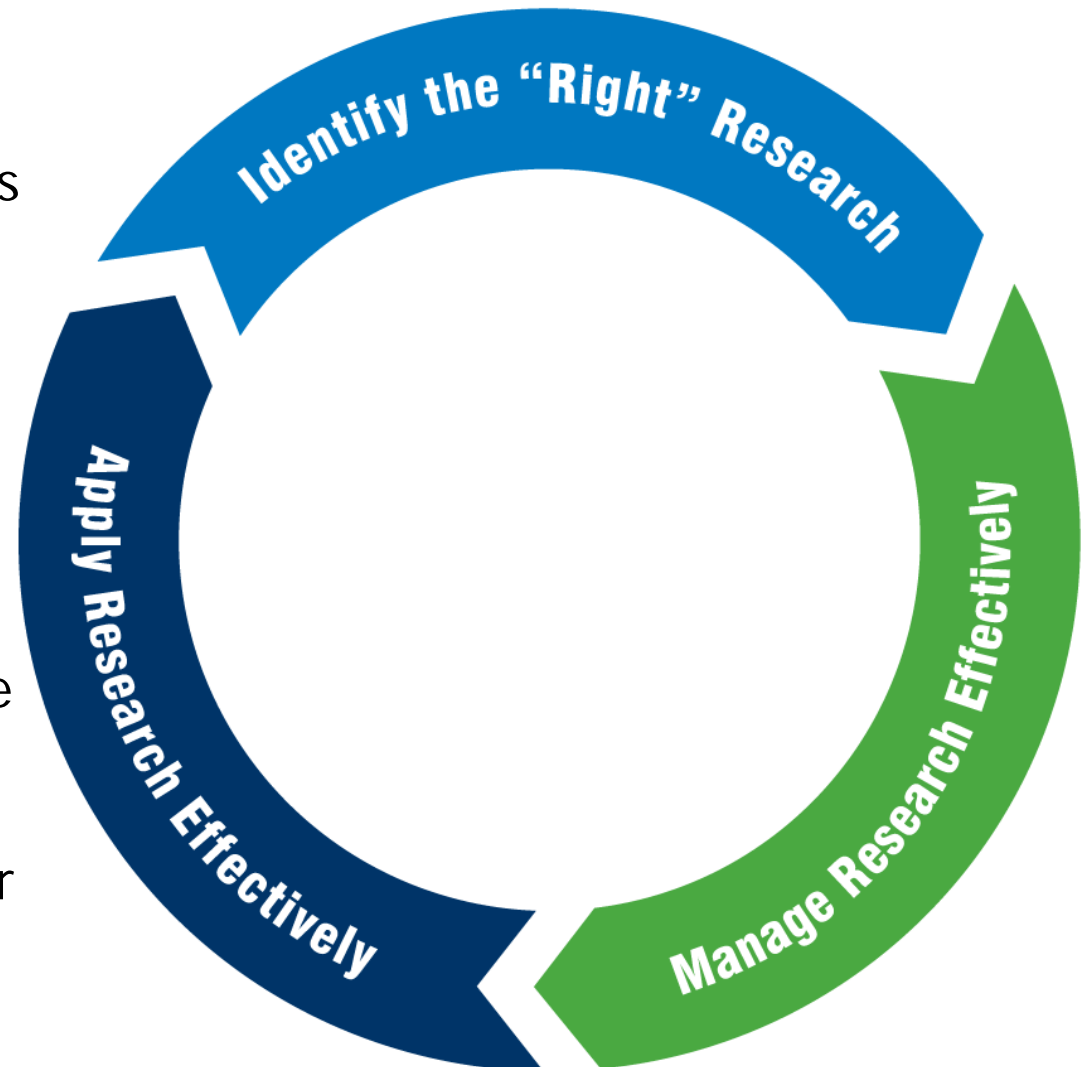
#1 - Research Agenda Should Be Re-Visited on An Ongoing Basis

Why?

- Roco's 4 generations of NT innovation will take decades
 - Passive nanostructures
 - Active nanostructures
 - Systems of nanosystems
 - Molecular nanosystems
- Cumulative, not one-off, research creates knowledge

So what?

- Build a foundation today for NT risk management that endures for decades



#2 - Research Agenda Should Align with Pending Risk Management Decisions

Why?

- Research is only valuable when it informs risk management decisions

So what?

- Risk research agenda should be set by “reverse engineering” pending risk management decisions
- Risk managers – regulators – must have substantial say in setting agenda
- Stakeholder input can be used to put “orphan risk” issues on agenda



#3 - Research Agenda Requires Visibility Into Product Pipeline

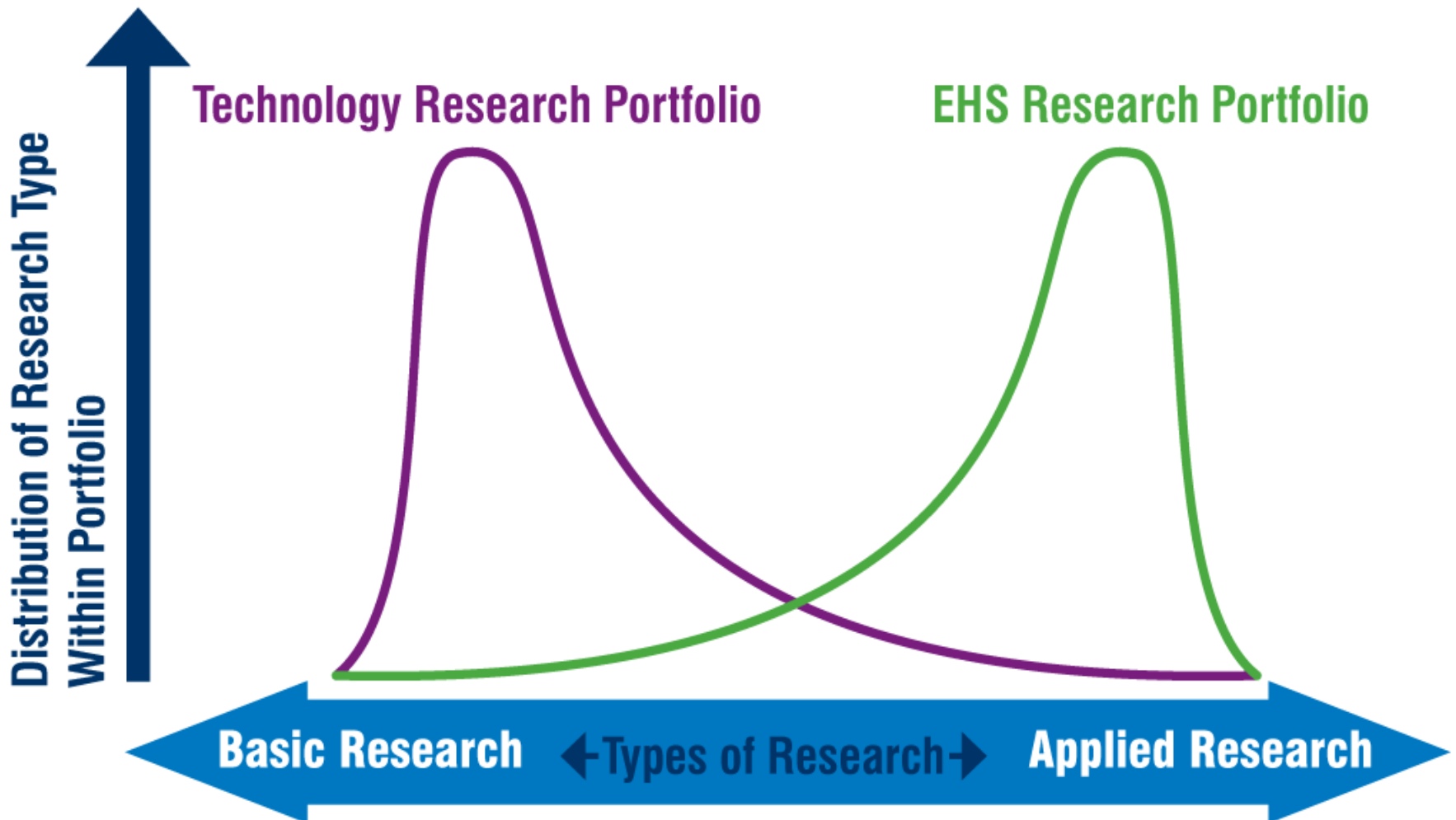
Why?

- A research agenda informed by product development pipeline can be more proactive than one based on ad hoc market surveillance

So what?

- Though hampered by proprietary considerations, options exist:
 - Pre-market notifications under TSCA & FIFRA
 - Product development pipeline surveillance, including aggressive monitoring of professional literature and industry conferences
 - Condition of funding for the \$1B+ of Federal NT R&D
 - Government-industry partnerships (e.g., NIOSH's Field Visit Program and EPA's Nanoscale Materials Stewardship Program)
 - Collaboration with other governments

#4 - EHS Research Should be Seen as Distinct from other NT R&D



#4 - EHS Research on NT Should Primarily be Applied Research

Why?

- Focused work needed to answer specific EHS questions

So What?

- Solicitor, not researcher, frames research questions
- Solicitor collaborates closely with researcher
- Schedules are tight, deliverables are specific
- All researchers – academic, government, contractors, NT manufacturers – eligible

#5 - EHS Knowledge Must Be Effectively Managed

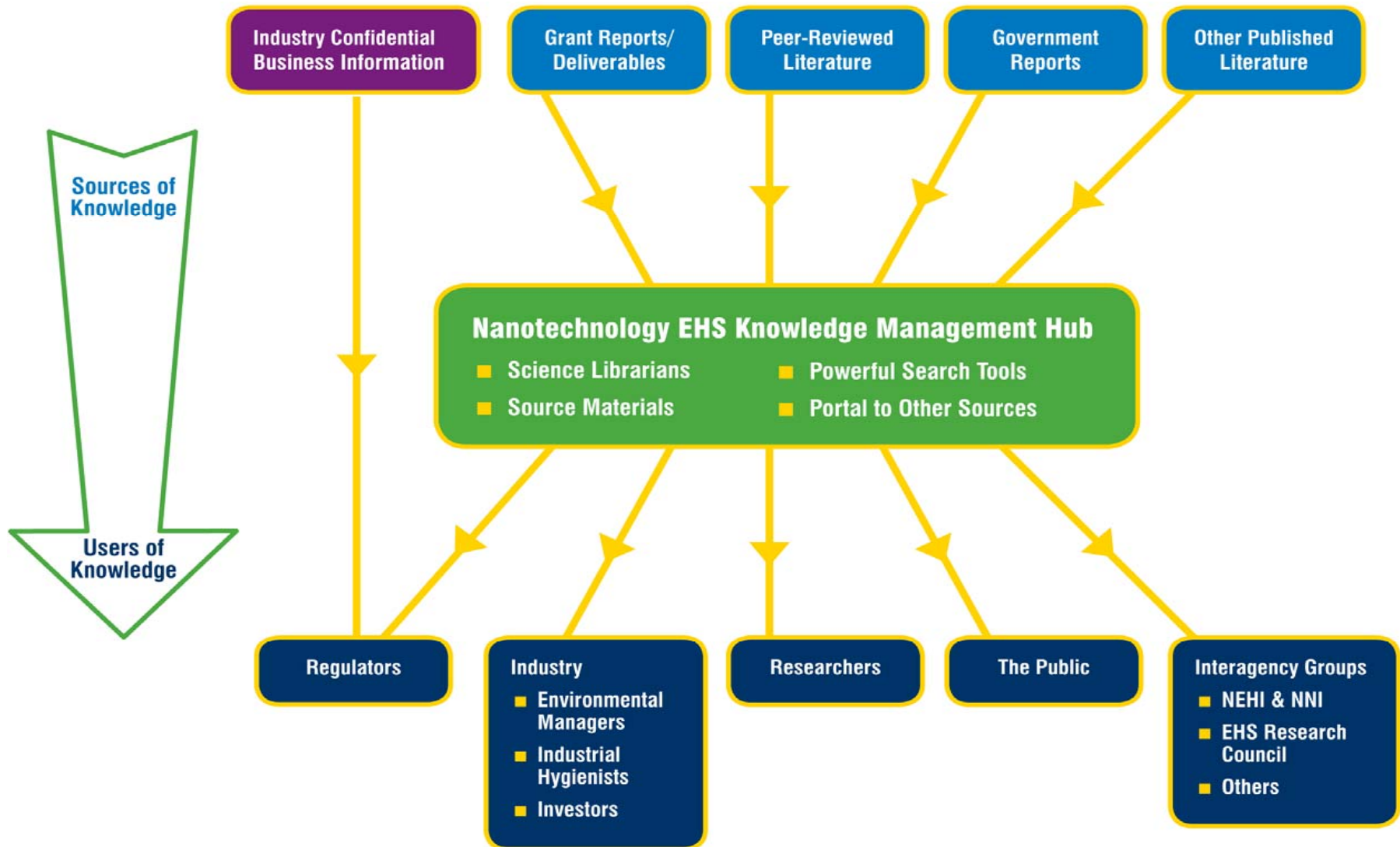
Why?

- Ad hoc approach to knowledge management (KM) fails to maximize return on Federal investment in research
- Multiple sites (e.g., ICON, NIOSH, PEN) create transaction costs; impede researchers, regulators, industry

So what?

- Arguably, a single KM system should be established for EHS NT research: comprehensive and current

#5 - EHS Knowledge Management: A Hub, Not a Portal



Re-Cap: Strong management as important as sound science

1. EHS research is an ongoing, not episodic, process over decades
2. Research must be constantly (re-)aligned with pending risk management decisions
3. Ensuring relevance of research requires visibility into NT product pipeline
4. EHS research is primarily applied research and should be managed accordingly
5. To maximize research value, EHS knowledge must be managed in a hub, not a portal

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