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## Nanotechnology and OSWER Meeting Panel

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Emerging Nanotechnologies Project

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Dr. Barbara Karn  
1 of 8

### 6 Thrusts for EPA Nano research program

- Build and sustain a community of researchers in nanotech and the environment—both applications and implications.
- Promote nanotechnology within EPA and its mission.
- Assure consideration of the environment and human health in government research programs related to nanotechnology
- Work with industry to assure environmentally responsible development of nanotechnology and products containing nanomaterials.
- Provide leadership in international activities involving environment and human health and nanotech.
- Provide education and outreach to the public to promote understanding of nanotechnology with respect to environment and human health.

Dr. Barbara Karn  
2 of 8

## International Activities

Proposed joint RFA with EC and US partners, NSF, NIOSH, NIEHS

International Dialogue for Responsible Nanotechnology

OECD

IRGC

GIN

ICON

"Evidence" for reports

Invited talks:

Taiwan, Singapore, Thailand, India,

Hong Kong,

China, Japan, Belgium

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3 of 8

## Green Nanotechnology Framework

1. Production of nanomaterials and products does not harm the environment

Making NanoX "greenly"

e.g., Green chemistry, Green engineering, LfE, Smart business practices

Using NanoX to "green" production

e.g., Nanomembranes, nanoscaled catalysts

Pollution Prevention Emphasis

2. Products of nano help the environment

Direct Environmental Applications e.g., environmental remediation, sensors

Indirect Environmental Applications e.g., saved energy, reduced waste

Anticipating full life cycle of nanomaterials and nanoproducts

NEXT STEPS: Policies that offer incentives for developing greener nanoproducts and manufacturing techniques

Dr. Barbara Karn  
4 of 8



Nanotechnology and the Environment  
 4th symposium sponsored by the Division of Industrial and  
 Engineering Chemistry  
 At the 231st American Chemical Society National Meeting  
 Atlanta, Georgia March 26-30, 2006



The objectives of this symposium are to highlight the latest research results in nanotechnology that address pollution prevention at its source through greener synthesis of nanomaterials and products and use of nanotechnology to reduce pollutants in current processes

Session topics:

- Overview of nanotechnology programs and issues
- Environmentally benign synthesis of nanomaterials
- Bio-inspired nanotechnology
- Use of nanotechnology leading to cleaner production
- Nanotechnology for environmental clean-up
- Nanomaterials for use in energy applications
- Nanotechnology related to the hydrogen economy

Co-Chair s: Barbara Karn, U.S.E.P.A; James E. Hutchison, University of Oregon  
 Florian Schottenman, General Electric; Nora Savage, U.S.EPA

Dr. Barbara Karn  
 5 of 8

Be ready for waste streams caused by nanotechnology

Materials/substance flow analysis

A Back of the Envelope MFA calculation: Switching to nano

Each EPA employee has 1 computer with 1 CRT monitor

20,000 employees replace their CRTs with flat screen LCDs

0.45 kg Pb/17 inch CRT (D E Report, US EPA)

9 tonnes of Lead to be disposed of from EPA monitors!



0.8 M<sup>3</sup> Lead ~ volume of 7 oil barrels



Can Nanotechnology change this waste picture?

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 6 of 8



## Nanotechnology and the Environment: Where we've come from and where we're going

Barbara Karn, PhD  
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American Chemical Society  
4<sup>th</sup> Nano and the Environment Symposium  
Atlanta, Georgia      March 26, 2006

Dr. Barbara Karn  
7 of 8

## GET INVOLVED

Professional Associations  
NanoMeeters  
Agency & Academic Contacts

Use Expertise in Agency

Dr. Barbara Karn  
8 of 8