# Partnering: Strategies and Examples

**AIChE Annual Meeting**

**1 November 2005**

**Vincent Magnotta**
**Manager, Technology Transfer**

magnotvl@airproducts.com

**John Tao**
**Director, Corporate Technology Partnerships**

taojc@airproducts.com

# Fast Facts

- Global gases, chemicals, equipment and services provider
- $7.4 billion in Revenue ( FY 04)
- Chemical industry safety leader
- Operations in more than 30 countries
- 18,500 employees worldwide
- Known for our innovative culture and operational excellence



AIR PRODUCTS

# Business Mix – the World's Only Integrated Gases and Chemicals Company

## Gases and Equipment

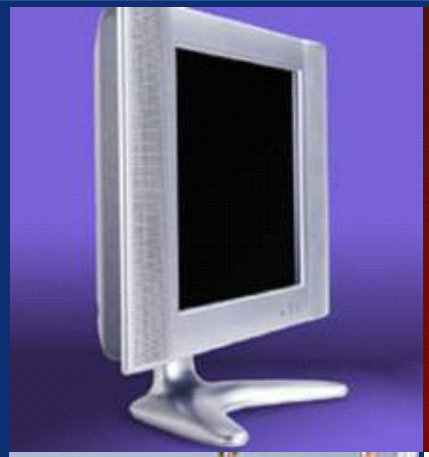
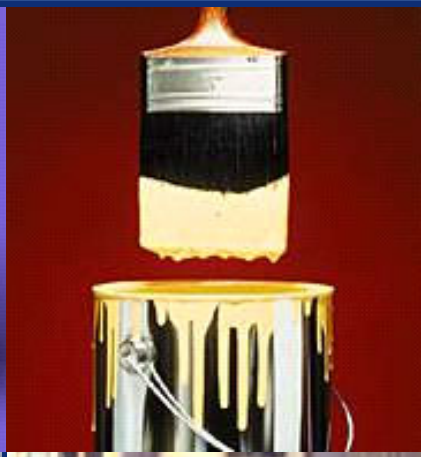
- Cryogenic Air Separation
  - Oxygen
  - Nitrogen
  - Argon
- Hydrogen
- Helium
- Specialty Gases
- Noncryogenic Air Separation
- Equipment And Technology
- LNG Heat Exchangers

## Chemicals

- Emulsion Polymers
- Amines
- Epoxy Additives
- Surfactants
- Polyurethane Intermediates
- Polyurethane Additives

# Focused on Four Growth Platforms

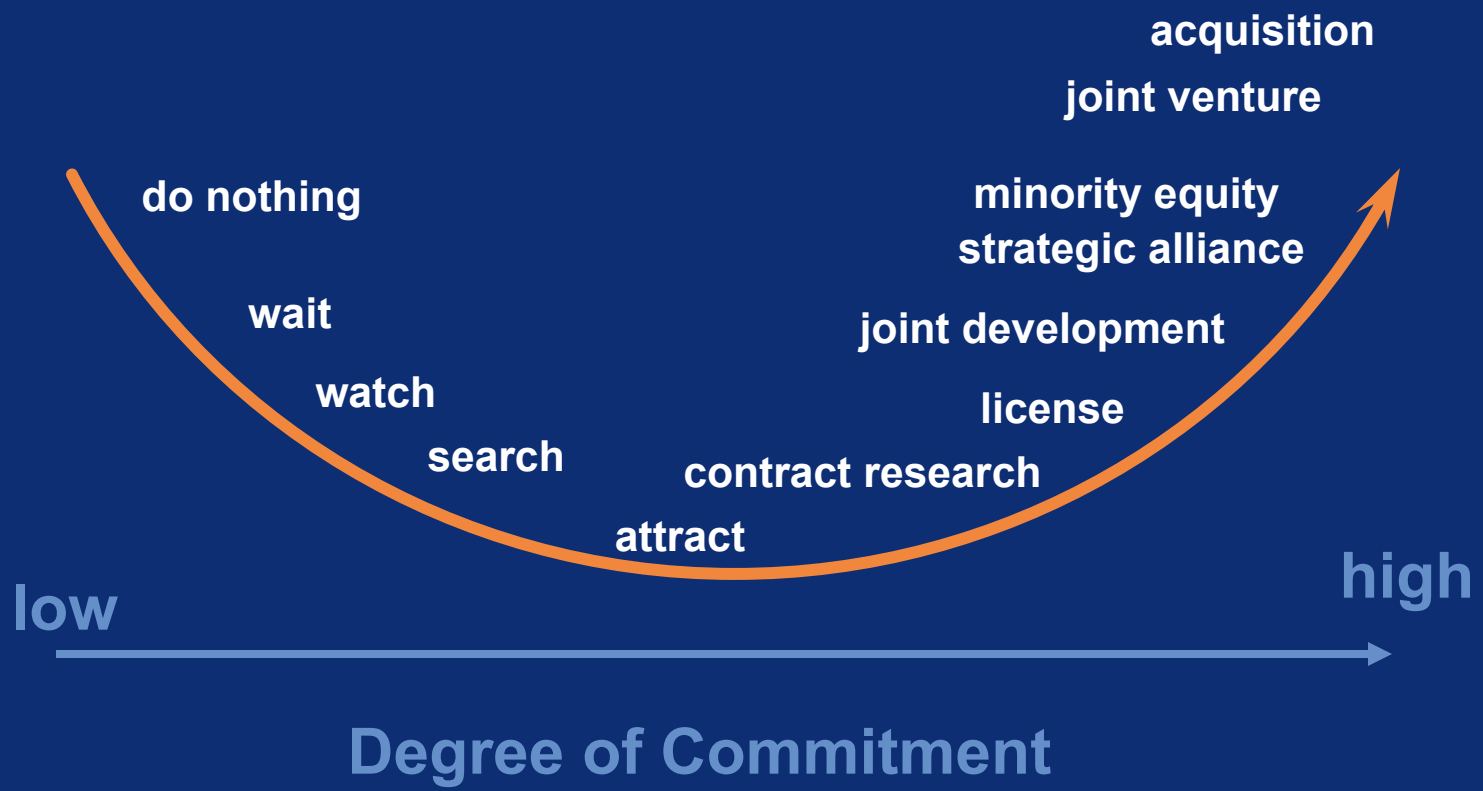
- Leadership positions
  - Electronics
    - Specialty gas
    - Precursors
  - Performance Materials
  - Refinery Hydrogen and Energy Solutions
  - Healthcare
    - Home medical services



AIR PRODUCTS

# Partnering: Degrees of Commitment






AIR PRODUCTS

# University Research Alliances

| Pros | Cons |
| --- | --- |
| **Fast access to resources, skills, and experience** | **Negotiating Intellectual Property rights** |
| **Establishes a relationship between Company and University** | **Project management** |
| **Obtaining favorable IP Rights** | **Communication challenge** |

# Emerging Models: Global Sourcing

| | Pros | Cons |
|---|---|---|
| **InnoCentive:** Post problems, pay only if they are solved` | Fast access to global array of knowledge<br>Reward based on solution; deferred risk<br>IP ownership | Expertise not broad<br>Confidential information disclosed in problem statement |
| **NineSigma:** Gathers proposals from qualified research groups | Fast access to global capabiities<br>Only non-confidential information used<br>Competitive proposals | Only nonconfidential information used<br>No assistance in building relationship with selected partner |



AIR PRODUCTS

# Tapping Russian R&D Resources

- Why?
  - Fresh perspectives
  - Speed
  - Lower costs
  - IP can be favorable
- How?
  - Direct Institute funding
  - Portals:
    - USIC (US Industry Coalition)
    - CRDF (Civilian Research & Development Corp)
    - ISTC (International Science and Technology Center)

# Typical Project Dimensions

- Annual Cost  $ 50K
- Russian team
  - 5-6 full time staff (> 50 % PhD level)
- IP Rights
  - More favorable than University  ( typical)

# APCI Collaboration with a Russian Institute

- Collaboration started in 1992, still going strong
- Numerous technology developments and insights
- Projects include distillation, heat exchange, combustion fundamentals, fuel-cell development and others
- For 2005, 57 scientists and support staff engaged



AIR PRODUCTS

# Strategy

- Expand reach to the over 400 Institutes in Russia
- Utilize “on the ground” staff
  - Matchmaking
  - Manage projects

# Learnings from Russian Partnerships

- Frequent communication vital
  - Email, email, email
  - Face to face meetings in their laboratories
- Develop work process
  - Ideas to projects
  - Template project agreements
- Personal Relationships vital
  - time to nurture trust and openness

# Partnering Examples

- SBIR Support Letters

# Partnering Examples

- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Licensing-out
  - Gas applications, chemicals
- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Joint Development Agreement
  - Nanotechnologies Inc (nanoparticles)
- Licensing-out
  - Gas applications, chemicals
- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Minority Equity Investments
  - Solicore (battery)
- Joint Development Agreement
  - Nanotechnologies Inc (nanoparticles)
- Licensing-out
  - Gas applications, chemicals
- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Joint Venture
  - DA Nanomaterials (wafer planarization)
- Minority Equity Investments
  - Solicore (battery)
- Joint Development Agreement
  - Nanotechnologies Inc (nanoparticles)
- Licensing-out
  - Gas applications, chemicals
- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# Partnering Examples

- Acquisition
  - American Homecare Supply (respiratory services)
- Joint Venture
  - DA Nanomaterials (wafer planarization)
- Minority Equity Investments
  - Solicore (battery)
- Joint Development Agreement
  - Nanotechnologies Inc (nanoparticles)
- Licensing-out
  - Gas applications, chemicals
- Licensing- in:
  - Wacker (emulsion polymers)
- Government Sponsored R&D
  - Ion Transport Membranes
- Contract Research
  - University Alliances
- SBIR Support Letters

# External Collaboration Innovation Award

Excellence in

Delivering Value

Recipients

- 2004 Ceramatec
- 2003 DOE
- 2002 Russian Institute

# Summary Conclusions & Take Aways

- Match strategic needs with partner strengths
- Insure alignment of goals
- Build a flexible but formalized agreement
- Develop  personal relationships
  - Build openness and trust
- Create & document a work process
  - Efficiency
  - Consistency
- Communicate, communicate,communicate