About PARC

Four decades of business results

- ~30 new businesses from PARC
- Innovation in nearly every Xerox product
- Licensing and co-development agreements with companies around the globe
- Impact across many industries

Open center for commercial innovation since 2002

- Partner with clients to generate, test and deliver new business ideas

“one of the most innovative commercial research labs in the world”
Kiplingers
Facts & Figures

- 170 research and business staff
  - Small teams, interdisciplinary approach
- 4 divisions
  - Computing Science, Electronic Materials and Devices
    Hardware Systems, Intelligent Systems
- More than 2100 patents and patents pending
  - Average 100+ issued patents per year since 2002
  - Among Top 300 US patent recipients
- Committed to impacting the world
Sample Projects

- Helped printing company move publishing business into mobile rich media

- Established fieldwork competency as base for new services business

- Providing novel interconnect technology for the next generation of high-performance computing

- Natural language search start-up based on PARC’s core technologies from PARC; acquired by Microsoft

- Helped launch solar concentrator company with technology and incubation

  “We think of PARC as our CTO,”
  Steve Horne, SolFocus Co-founder
## Interdisciplinary Portfolio

### Electronic Materials and Devices
- **Electronics Design & Prototyping**
- **Flexible Electronics**
- **High-density, Resilient Interconnects**
- **Large-area Electronics**
- **Microelectromechanical Systems (MEMS)**
- **Optoelectronic Emitters & Detectors**
- **Organic Device Design**
- **Printed Electronics**

### Information and Communication Technologies
- **Automation & Optimization**
- **Context-aware Computing**
- **Enterprise Collaboration & Knowledge Systems**
- **Human Machine Interfaces**
- **Image Recognition**
- **Information Visualization & Sensemaking**
- **Natural Language Processing**
- **Networking**
- **Security And Privacy**

### Biomedical Systems (Launched 2002)
- **Fetal Cell and Cancer Cell Detection**
- **FHS delivery**
- **High-throughput Nanocalorimetry**
- **de novo Peptide Sequencing**
- **Continuous Glucose Monitor**
- **Flow Cytometry**

### CleanTech (Launched 2005)
- **Adaptive Energy Systems**
- **Energy Optimization**
- **Demand Response**
- **High-rate Clarification w/o membranes**
- **Renewable Liquid Fuels (CO₂ extraction)**
- **Solar Energy**
- **Thermal Management**

1/26/2010
Innovating the *Green* Economy

&

*The University’s Role*

My use of ‘innovation’ is in technology
Innovation (@ PARC)

Invention & Commercialization

- Ethernet
- Alto (GUI)
- Laser Printing
- Solar Concentration
- Data Center Efficiency

Investment Decisions → Marketplace Value → Financial Return → Ideas

1/26/2010
Risk-Break Waterfall

- Credible Idea
- Technology feasibility
- Technical milestone
- Customer validation
- Production prototype
- Initial Sales
- Venture
- Banks/Project
- Strategic/Angel
- Government

### Stimulus Funding:
- Emphasis on “shovel-ready”, demonstration projects
- Commercialization path defined
- VC/project financing more difficult

### Changing?
- [DOE] stimulus funding
- Financial crisis/recession impacts

1/26/2010
Green Economy

Simply too big to digest, especially with so much political (regulatory) risk and challenged value propositions

cleantech, greentech, smart energy, smart grid, eco-___,

So, let’s focus on technology innovation, in bite-sized pieces
## Green Economy: …through a technology lens

<table>
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## Green Economy …through a technology lens

### Transportation
- Fleet management
- Mass trans. routing/data solutions
- Logistics mgmt
- Carpooling
- Hybrid motors
- PHEV
- Fuel cell vehicles
- Biodiesel
- Intermodal tracking
- NOX/SOX reductions
- Cold-ironing systems
- Diesel particulate matter filters
- Combustion
- Fuel blends
- Flex fuel apps
- Drivetrain conversion
- Exploiting GPS and location information
- Monitoring and control of driver behavior
- Water monitoring
- Cooling solutions
- Wastewater recycling
- Adv. water metering
- Storm-water and flood control, rain harvesting
- Smart irrigation
- On-site water disinfection
- Membranes for water treatment
- Advanced filtration
- Produced water (from oil exploration)
- Water pumping
- Reverse osmosis
- Advanced filtration
- Emissions controls
- Scrubber technology
- Carbon and GHG monitoring and control
- Carbon sequestration
- Carbon Capture/ storage Technology enablers for Carbon markets
- VOC Reduction
- Waste cleanup
- DI water supply
- Agricultural waste Recycling
- Microbial water treatment
- Bio based packaging
- Methane capture/ storage Soil technology

### Air, Water, Waste
- C-Si Solar
- CIGS
- Thin film solar
- PV cells
- Solar thermal systems
- Ethanol
- Biobased fuels
- Tidal energy
- Wave energy
- Landfill gas
- Agricultural waste energy
- Hydropower
- Turbine blade design
- Advanced fluid flow designs
- Wind power

### Energy Storage
- Batteries
- Battery chemistry
- Ni-metal hydride
- Life for batteries
- Depth of discharge for batteries
- Flywheels
- Grid hardware/infrastructure
- Power storage for renewables

### Smart Power
- Advanced metering
- Network arch. for power mgmt
- Advanced fuel cell membranes
- Methanol fuel cells
- PEM fuel cells
- Flywheels
- Grid scale hardware and infrastructure
- Monitoring renewables
- Transmission efficiency
- Elec.controls for power distribution
- Novel metals and alloys for power

### Energy Efficiency
- Pumps for water/material
- Industrial process improvements
- Advanced lighting controls
- Water heating
- HVAC solutions
- Heat pumps
- Waste heat mgmt
- Efficient heat transfer
- Utility scale natural gas controls
- Display systems for energy management
- Materials use in microelectronics mfg
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- LED lighting
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- Cement production
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- Modular housing
- Disaster relief housing
- Architectural Designs for thermal mgmt
- Office environment
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- Recycled
# Green Economy...through a Technology Lens

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Energy-related Technology Work at PARC

This is a result of strategic constraints imposed on the research freedom of our inventors.

1/26/2010
The Perfect University for Innovation

- World-class researchers/facilities
- Well-funded: endowments, corporate, gov’t
- Top graduate science, engineering & business programs
- Transparency
- Administrative (transactional) efficiency
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Very effective when graduate students/professors start companies. Outsiders may have a very different experience, or just avoid one altogether.
The Perfect University for Innovation

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- Transparency
- Administrative (transactional) efficiency

- Be the credible voice (Do the numbers!)
- Don’t be shy → promote, partner, and profit!
Thanks!

Dave Weinerth

David.weinerth@parc.com

650-812-4428