
Innovating the **Green** Economy

The University's Role

Dave Weinerth

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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



Dai Nippon Printing Co., Ltd.

- 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)
Microfluidics

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

Algae Dewatering for Biofuels
Demand Response

Energy Optimization

High-rate Clarification w/o membranes
Renewable Liquid Fuels (CO₂ extraction)

Solar Energy
Thermal Management

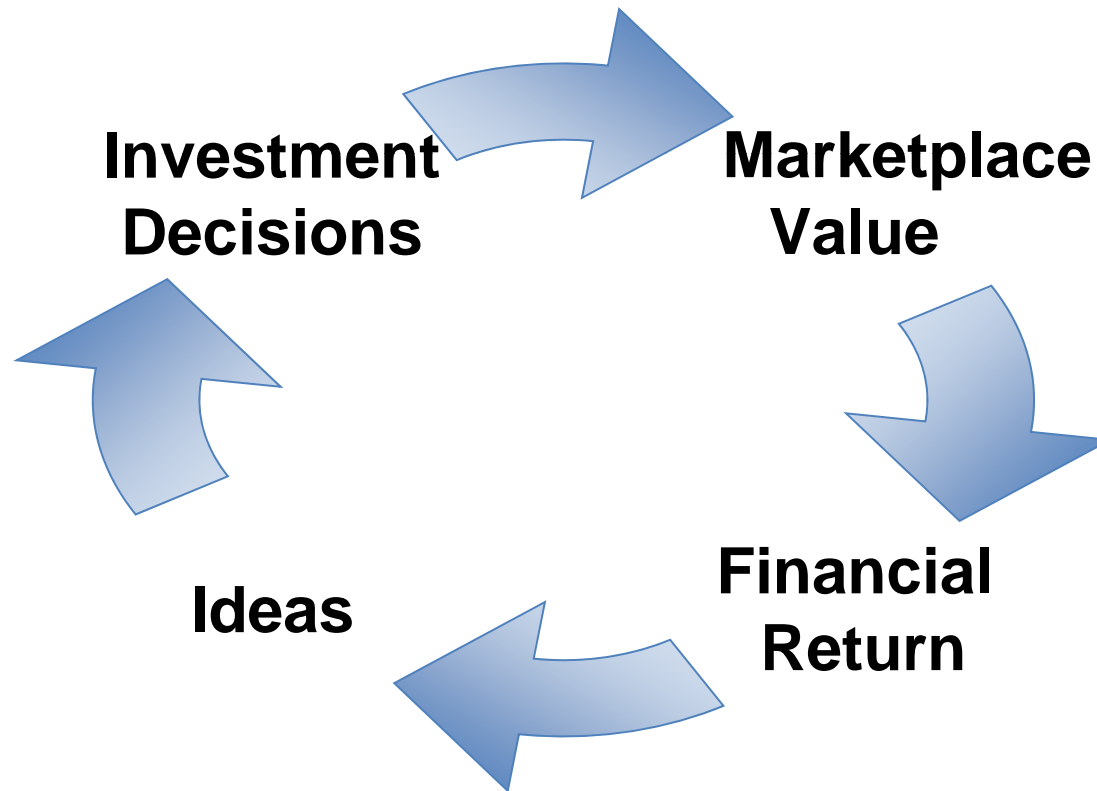
Innovating the *Green* Economy

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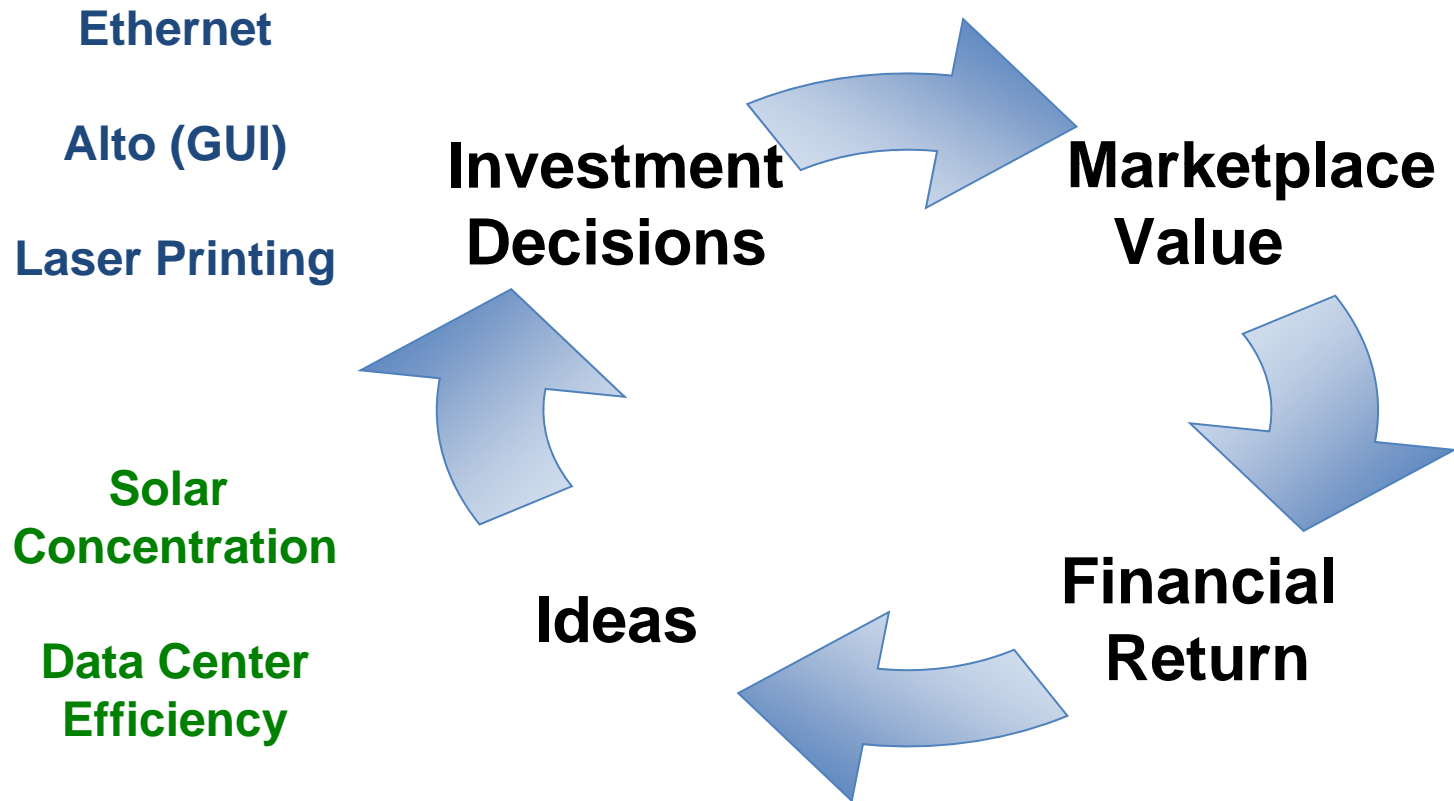
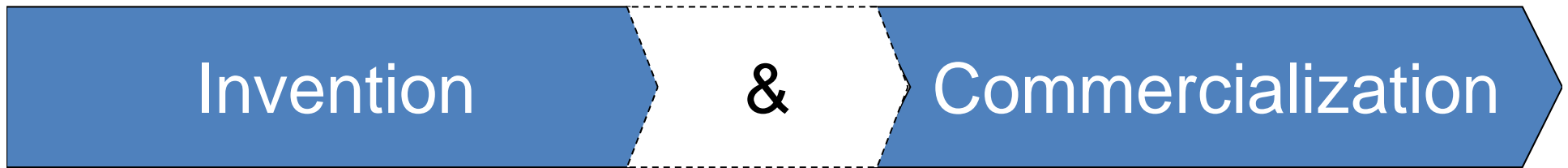
The University's Role

My use of
'innovation' is in
technology

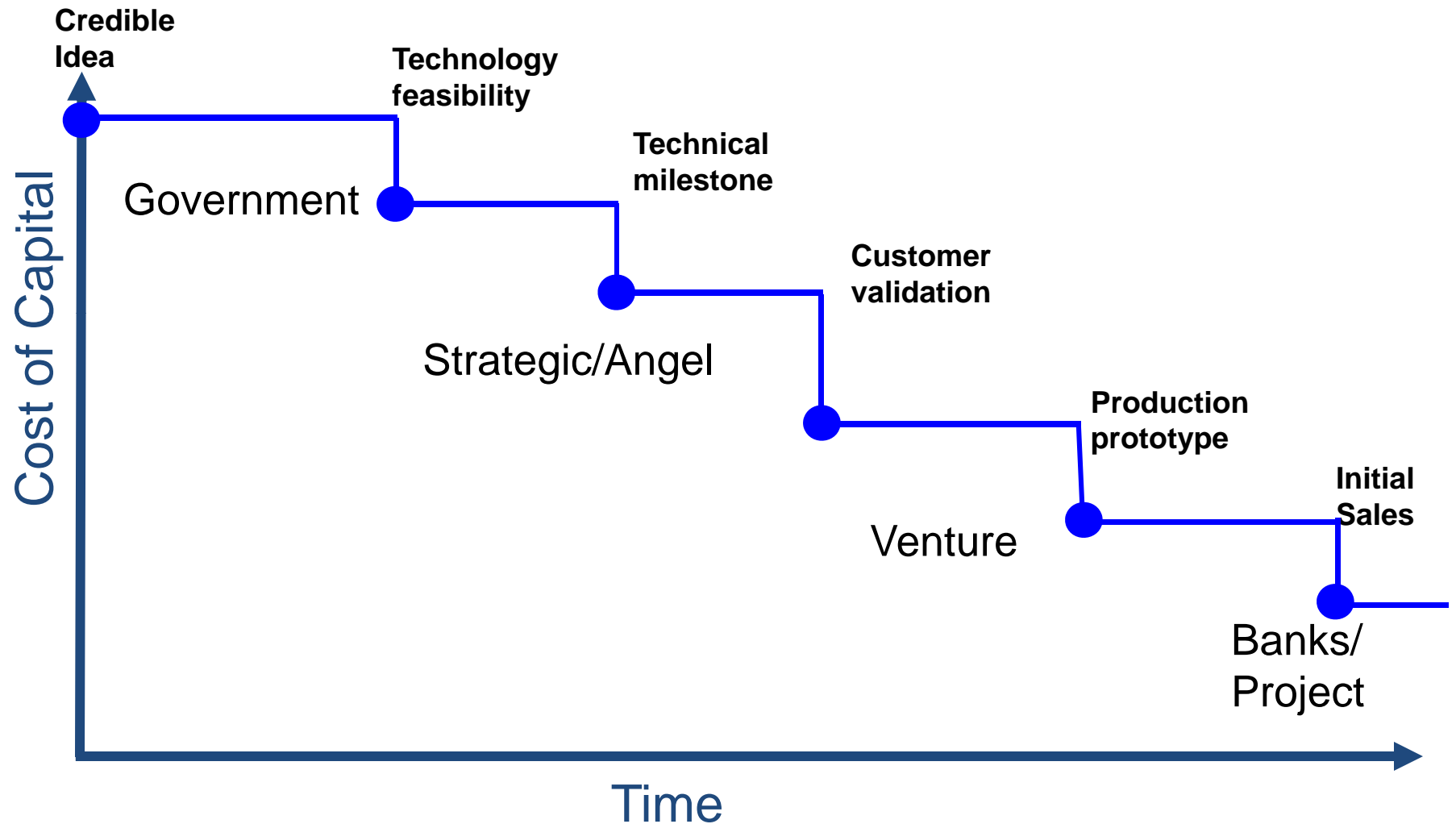
Innovation (@ PARC)



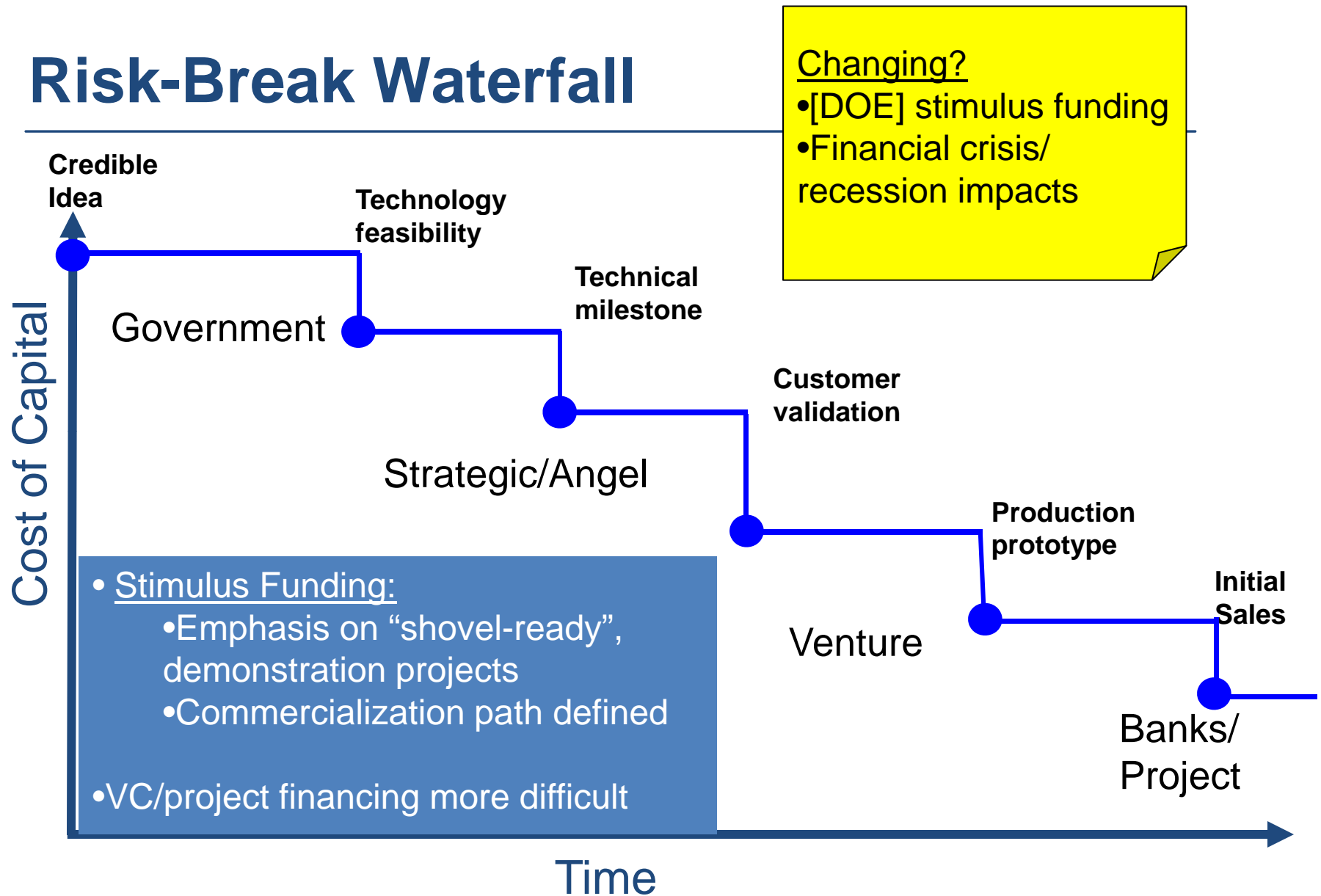
Innovation (@ PARC)



Risk-Break Waterfall



Risk-Break Waterfall



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*

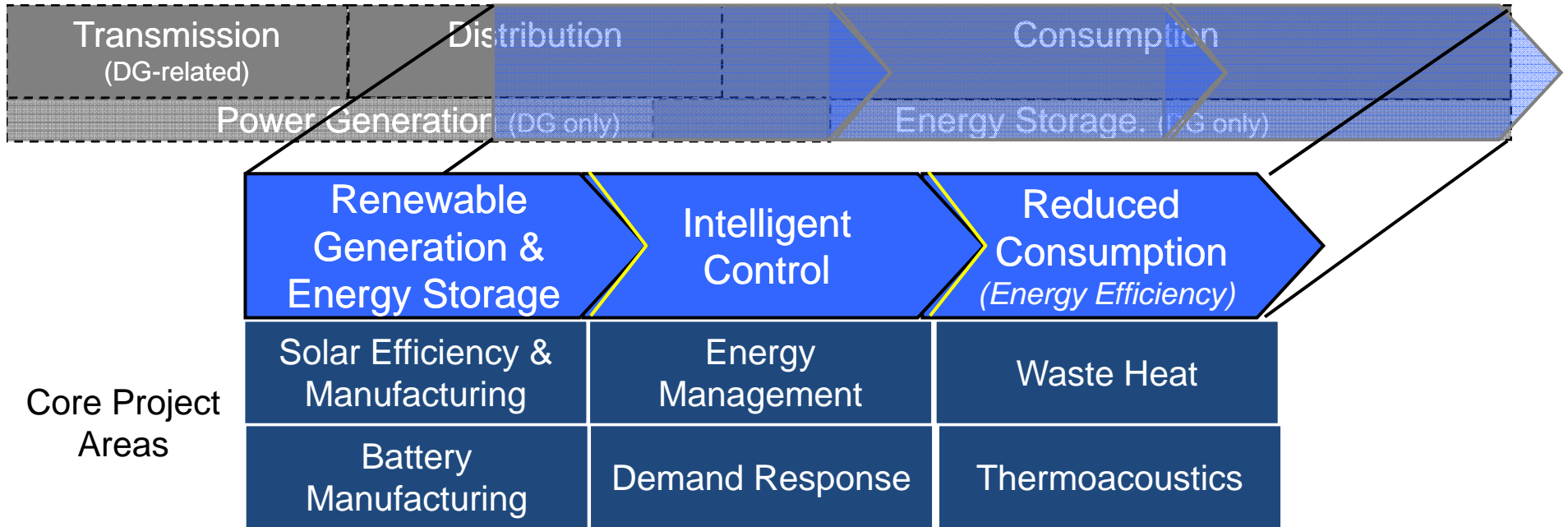
Transportation	Air, Water, Waste	Renewables	Energy Storage	Smart Power	Energy Efficiency	Green Building
Fleet management Mass trans. routing/ data solutions Logistics mgmt Carpooling Hybrid motors PHEV Fuel cell vehicles Biodiesel Intermodal tracking NOX/SOX reductions Cold-ironing systems Diesel particulate 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	C-Si Solar CIGS Thin film solar CPV PV Coatings Polysilicon Residential solar systems Ethanol Biobased fuels Tidal energy Wave energy Landfill gas Agricultural waste energy Hydropower Turbine blade design Advanced fluid flow designs Wind power	Batteries Battery chemistry Ni-metal hydride Hydrogen storage Li-ion cells Improved cycle life for batteries Depth of discharge for batteries Flywheels Grid hardware/ infrastructure Power storage for renewables	Advanced metering Network arch. for power mgmt Cloud computing, applied to grid Solid oxide fuel cells 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	Pumps for water/ material Industrial process improvements Natural gas monitoring and control LED lighting 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 Deposition and sputtering	Insulation materials Cement/alternative Cement production BIPV Indoor air filtration systems Modular housing Disaster relief housing Architectural Designs for thermal mgmt Office environment Low VOC carpeting and flooring Water saving toilets, showers, plumbing Residential heat pumps Recycled

Green Economy ...through a technology lens

Transportation	Air, Water, Waste	Renewables	Energy Storage	Smart Power	Energy Efficiency	Green Building
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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.

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- 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

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

Thanks!

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