

ETown:

Place the Region on the World Map
(Version 2 summary)

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Salient Features:

6 Es: Energy, Environment, Electronic, Experimental, Educational, Ecological

- A combination of a *Science Park* and a *Smart City*
- A City as *a Laboratory*: dedicated to “living experimentation” of a truly sustainable development
- A *Research Nexus* for energy, environment, economic development, engineering, and design
- A setting for *Lifelong Learning* for all ages
- A City of tomorrow to - live, work, learn, and play - in *harmony with nature*
- An Energy sufficient-Environmentally responsive, knowledge-based economy *Technopole*

Inventiveness, a great deal of organizational work and the obsessive persistence of the locals put **Davos**, a small city in Switzerland, on the world map.



ETOWN: An Energy Davos around Cheat Lake?



ETown: An idea worth exploring

Presentation Topics:

- Global Perspective
- National Perspective
- Local Perspective
- Similar Ideas/Initiatives/Projects
- Next Step?

Global Perspective

Simple Model

Major trends

Globalization

Information Revolution

Urbanization

Climate Change

Significance of the Region

Urbanization Challenge

- To accommodate the world's urban population, we need to build a new town of One Million every week for the next 45 years
- More than 2/3 of total energy consumption is needed for urban metabolism
- More than 2/3 of the CO₂ emissions are due to it

Significance of the Region

- Birthplace of Conventional Energy; Titusville, PA
- Standard Oil, first truly energy multinational
- Auto-centered pattern of urbanization
- Environmental costs
- A role to play for the future?

National Perspective

Clean Energy Race

Energy Innovation

ARPA-E

Gas revolution

Clean Energy Race

“In the 1980s, America was home to more than 80 percent of the **world’s wind capacity, and** 90 percent of its solar capacity. We owned the clean energy economy. But today, China has the most wind capacity. Germany has the most solar. Both invest more than we do in clean energy. Other countries are exporting technology we pioneered and chasing the jobs that come with it because they know that **the countries that lead the 21st century clean energy economy will be the countries that lead the 21st century global economy.**” President Obama, Georgetown University, March 30, 2011

Former Chinese Premier Wen Jianbao at the opening ceremony of the 5th World Future Energy Summit held in Abu Dhabi on January 16, 2012, delivered a clear message to the world about **China’s plans for a green and sustainable development** with specific goals for energy intensity and carbon emission intensity targets, as **reflected in China’s 12th Five-Year Plan.**

Clean Energy Race

- The **emerging clean energy economy** profoundly impacts the environment and the role of government in transitioning major economies to a sustainable development path has important global implications.
- The transition to a sustainable and clean energy system will be pioneered in *regions and by institutions* that are able to **research, engineer, and commercialize** new trans-technologies.
 - From our NSF proposal



- The American Energy Innovation Council (AEIC)
- “...**necessity** of public and private cooperation to address the ‘**wicked problem**’ of a sustainable and stable energy system. Due to the over dependency of our economy on energy and the rising concerns around energy scarcity and security, accelerating **energy innovation** is largely thought to be the only way forward. ”

Gas Revolution

- "Shale gas really has been a revolution that's happened extremely rapidly"
- "It comes down to employment. Shale gas has created hundreds and hundreds and hundreds of thousands of jobs in the last five years in the United States. It's brought \$1 billion of revenue into the state government of Pennsylvania.....it does have a transformative impact."
- "This is a great resource — this is the biggest energy innovation probably in the last 30 years, that we've seen. But it has to be done in a way that is both environmentally responsible and also acceptable to the public."
 - Daniel Yergin, 2011. The Quest: Energy, Security, and the Remaking of the Modern World

...and we are in the middle of it all

Strategic Advantages of the region

A key Energy Rich Region	West Virginia is part of region that has played a significant role in the emergence and development of commercial energy over the past 150 years. WV has significant reserves of fossil fuels and potential for the development of renewable energy resources.
Energy Heritage	West Virginia once led in oil production, now is a major coal producer, is an emerging player for gas, and has potentials for renewables like biomass, wind, and geothermal.
Expertise	A large pool of energy experts in the region, including researchers in the region's major academic institutions like WVU, Pitt, CMU, and experts in National Technology Laboratory (NETL).
Location	Access to the energy market of the largest eastern U.S. megalopolis running from Boston to Washington D.C. and beyond.
Proximity to D.C.	Easy access to events and activities in federal agencies and major institutions like the World Bank, IMF and numerous NGOs and think tanks; links to Congressional energy program and policy development.
Natural amenities	"Almost heaven", "wild and wonderful" image of state is attractive to environmentally conscious creative class in energy/environment sector.

Local Perspective

WV as an ERRs

Rebrand; Change the image

Sustainable Regional Development

WVU

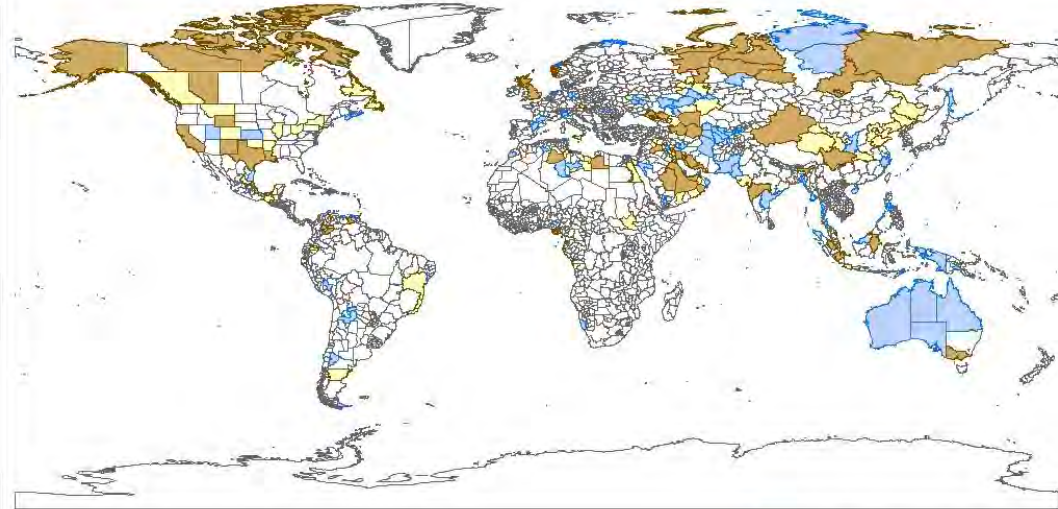
Generate Human Capital

A source of economic development

Lead Regional collaboration

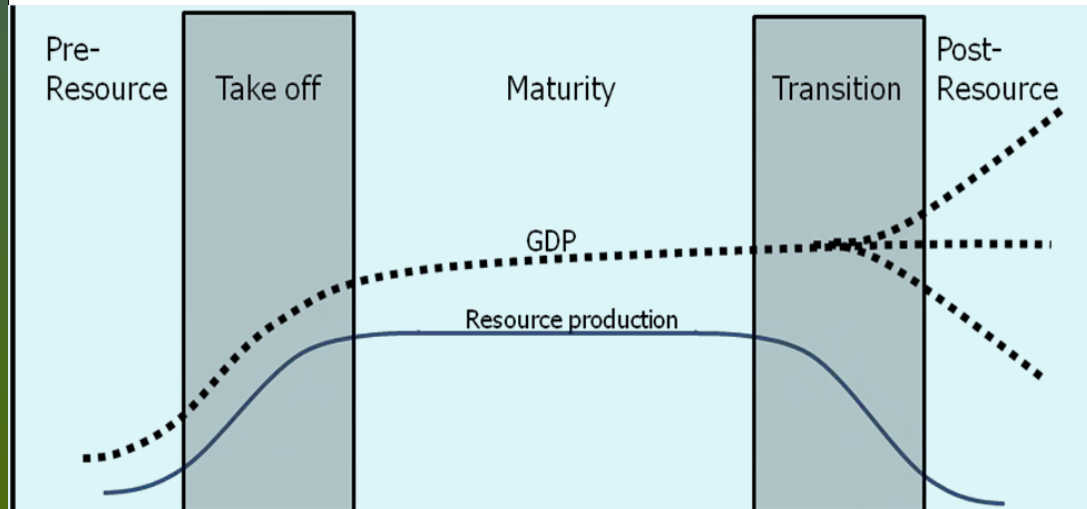
ERRs around the world

Energy Rich Regions (ERRs) are regions endowed with substantial reserves of exhaustible energy resources – below are regions rich in oil and gas around the world.



- ERR with Oil and Gas Resources
- ERR with Gas Resources
- ERR with Oil Resources

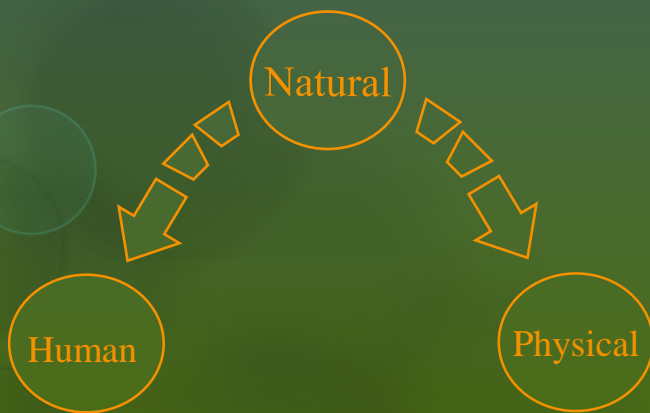
WV a typical ERR
Rich region poor people



Wealth & Development of ERRs



- Total **wealth** of an economy is embodied by natural, physical, and human capital forms.
- The most valuable natural capital are exhaustible energy resources – that enjoys a strong world market.



- Most important **development objective** is to convert natural capital (energy resources) into other forms of reproducible capital.

What is in it for the Region (WV)?

- Place the region on the world map as Energy Davos
- Rebrand the region: Energy NOT Coal
- Turn this typical Energy Rich Region (ERR) into a Diversified, Intelligent, Creative Economy (DICE)
- Make the region a shining example of sustainable regional economic development for ERRs around the world

Rebrand WV from Coal to Energy

From this:



Coal
Mining disasters
Environmental
degradation

To this:



Clean Energy
Creative Economy
Harmony with Nature

Changing the image from COAL to ENERGY does not mean to downgrade the coal industry, rather the goal is to position the state as a front runner in making coal a clean and abundant energy source bound to play a key role along with gas in transitioning from exhaustible fossil fuels to renewable energy sources .

In transitioning to a sustainable energy system, fossil fuels will continue to be a major source of energy both in the United States and internationally. The key is to focus on research and development aimed at producing environmentally acceptable, safer and more efficient mining, gas extraction and uses of these valuable resources.

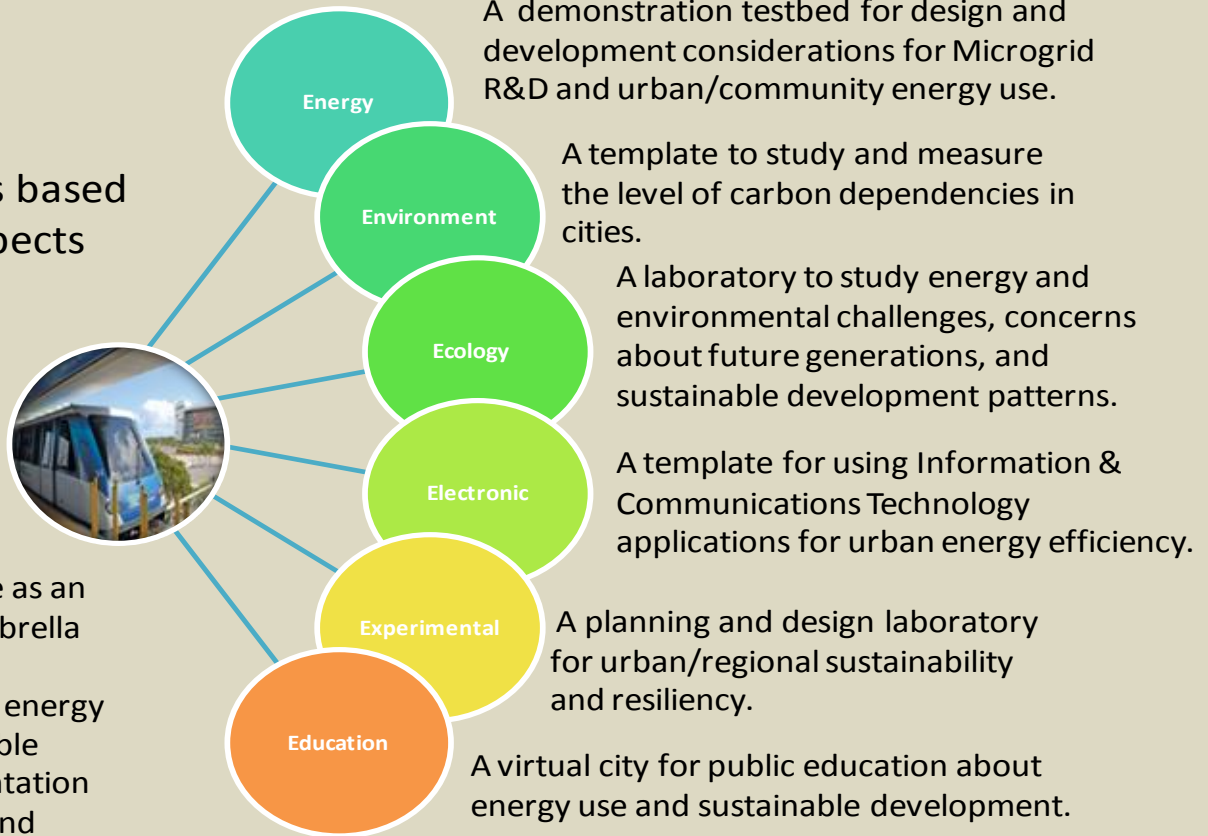
What is in it for WVU?

- Break disciplinary silos to do trans-disciplinary research (a unique instructional lab)
- **Make WVU, an emerging 'entrepreneurial university', leading the energy economy innovation**
- Make WVU as the test-bed in transition to a clean energy era (federal research \$)
- Attract **the 'creative class'** (energy/environmental/sustainability/creative economy bright minds)

ETown Concept

The vision for ETown is based on six inter-related aspects of community life and economic enterprise.

The ETown concept can serve as an interdisciplinary research umbrella for well-defined projects that demonstrate linkages among energy production and use, sustainable environments, and implementation and adoption of Smart Grid and Microgrid technologies.



Similar Initiatives/Models/Projects

Around the World

In the US

In Academia

Next Steps?

"Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work." — Daniel Hudson Burnham (1846-1912)

ETown is no small project.

Idea Conception to Project Formulation

- **Initiate, Plan, Design, Develop, Run** (city as a lab, perpetual development)
- **Action Plan:**
 - 1- Strategic Review (similar initiatives, key players)
 - 2- Strategic Choice (visioning, team building)
 - 3- Action Plan (organizational, economic/financial, physical foundations)