



European Parliament

**EURACOAL**  
European Association for Coal and Lignite



**WORLD COAL  
ASSOCIATION**

# Coal the Economic Engine for Development of Pakistan

Irfan K. Ali, Chairman

*TharPak Consortium*

**WCA-EURACOAL Workshop:**

**Does a prosperous world economy  
need coal?**

Tuesday 13 November 2012

# Pakistan Energy Crisis

## Population:

USA                      3 rd

## Energy Consumption:

9 th @

12,924.224 kWh per capita

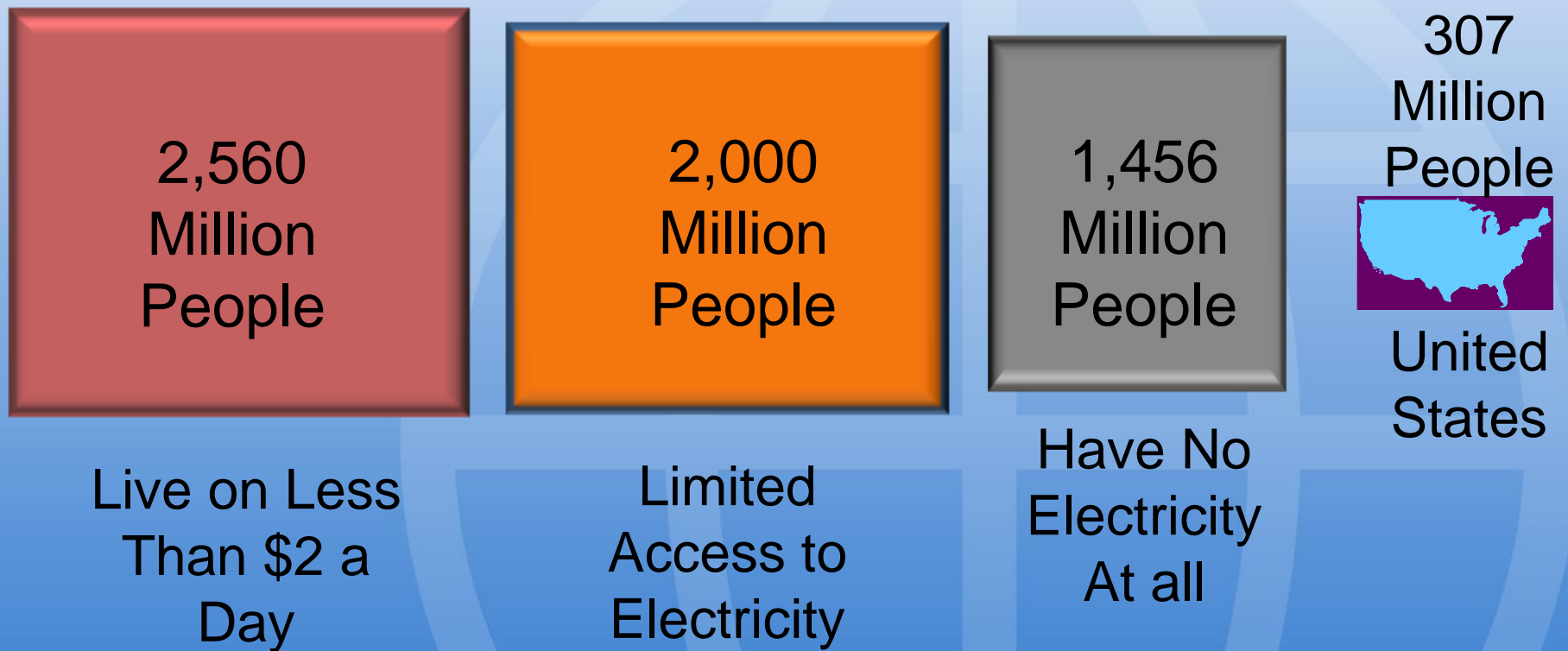
Pakistan              5 th

164 th @

430.183 kWh per capita

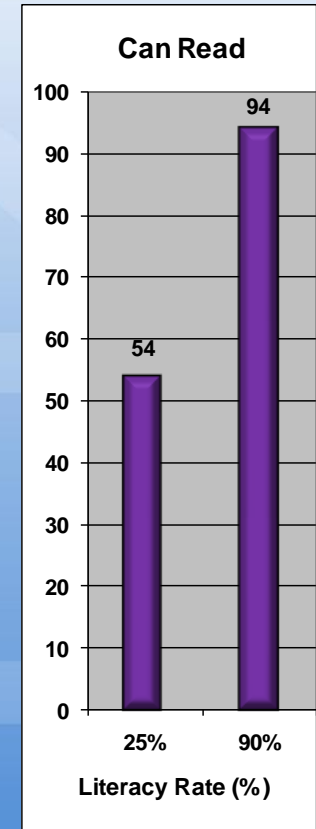
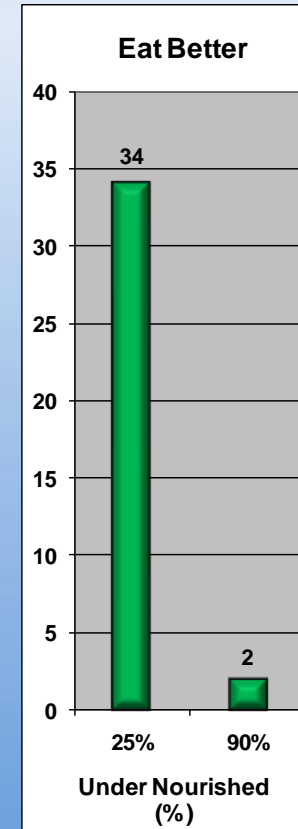
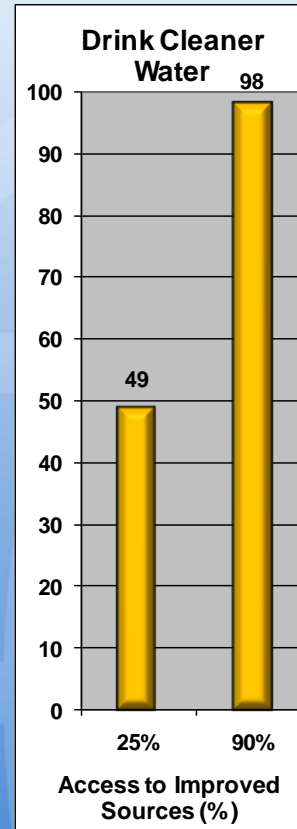
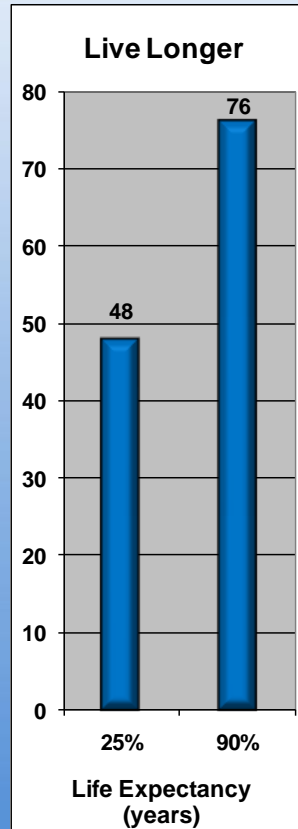
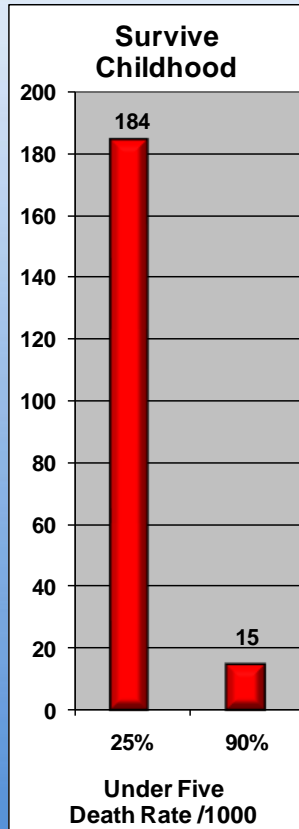
Pakistan Installed Capacity (MW)	Projected Demand		Gap (MW)
	Year	MW	
17,897	2010	24,474	6,577
	2015	36,217	18,320
	2020	54,359	36,462
	2025	80,566	62,669
	2030	1,13,695	95,798

# The Scale of Global Poverty and Energy Deprivation



Source: Dr. Frank Clemente, Professor Penn State University

# Coal/Energy & Poverty Reduction



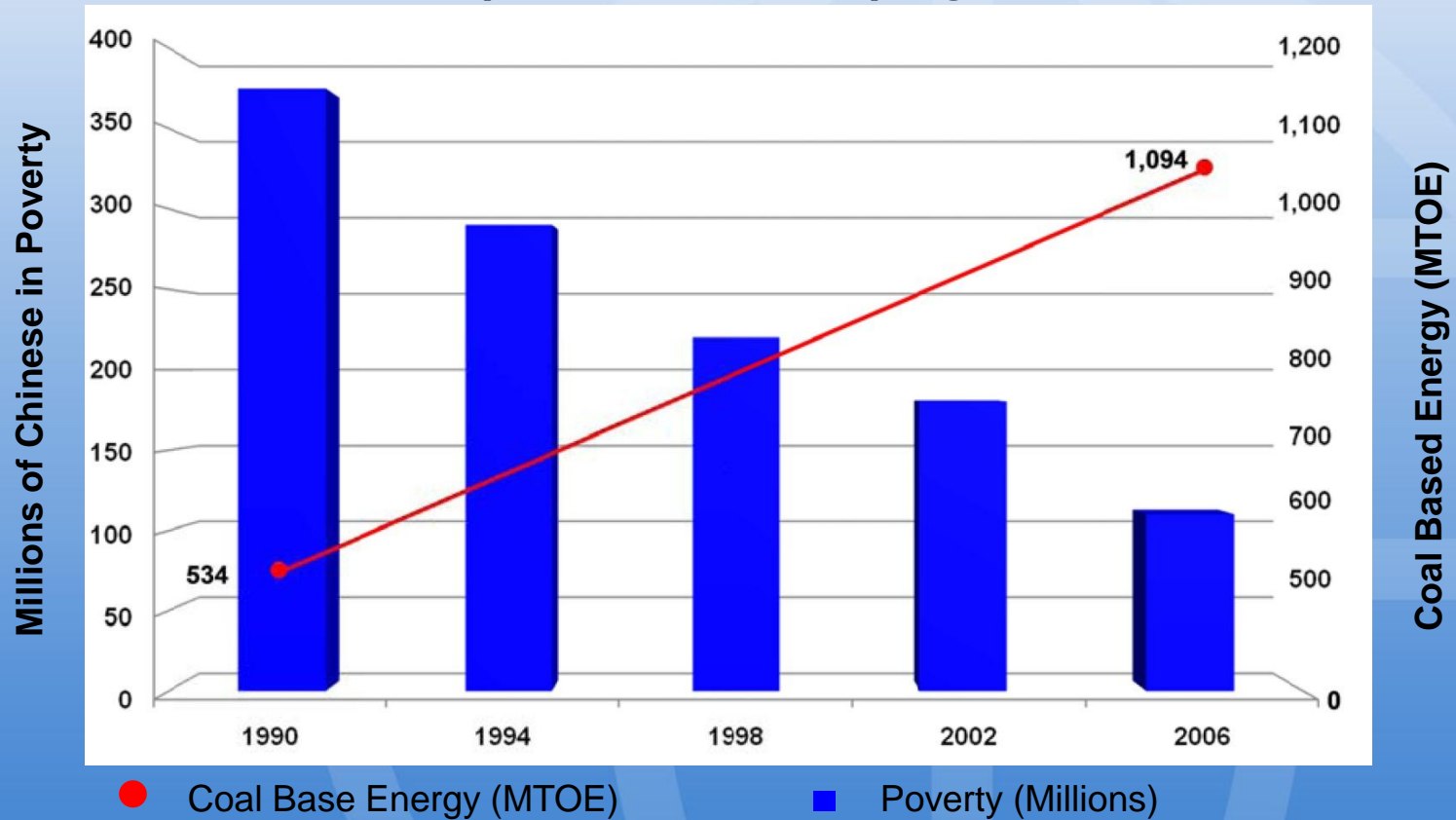
Energy is Good: People in Societies with Greater Access to Electricity

25% and 90% average percent of population with access to electricity

Source: Dr. Frank Clemente, Professor Penn State University

# Out of Poverty: Coal Based Energy has Propelled China Forward

*“China is an example for the developing world” IEA, 2007*

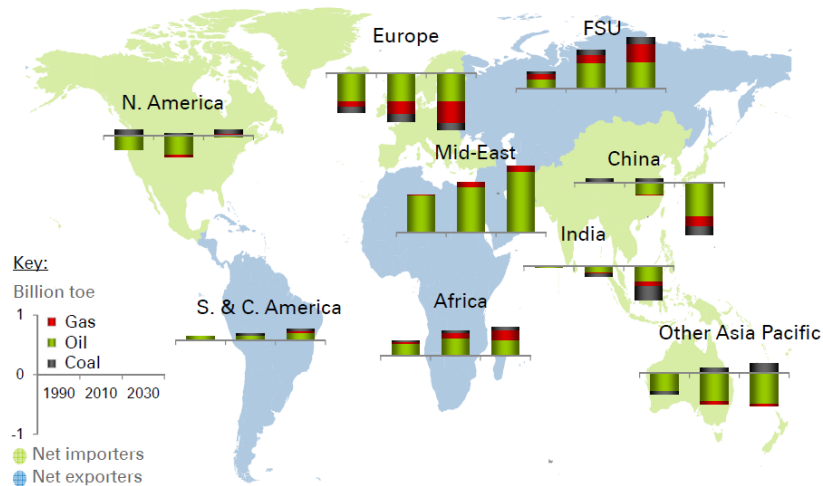


Note: Poverty measures follow World Bank definition of \$1/day income

Source: IEA, 2007; EIA, 2008

# Energy Imbalance

Energy imbalances improve in the Americas...

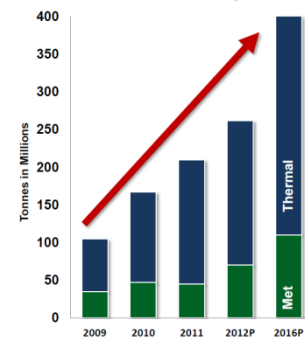


Energy Outlook 2030

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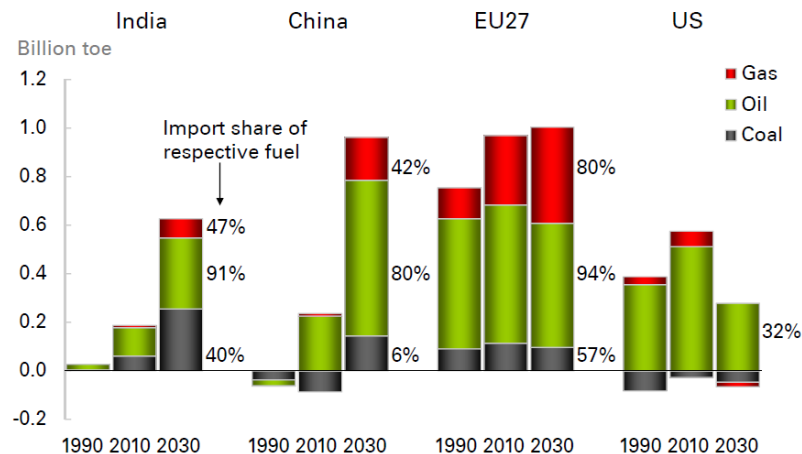
© BP 2012

China Net Coal Imports



Source: Forecasted imports and new coal generation based on Peabody estimates

Import dependency rises in Asia and Europe...

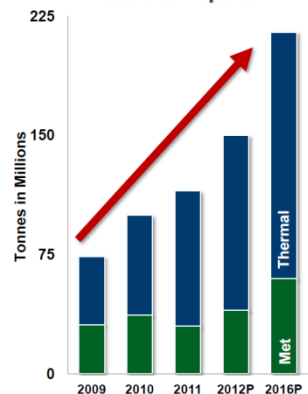


Energy Outlook 2030

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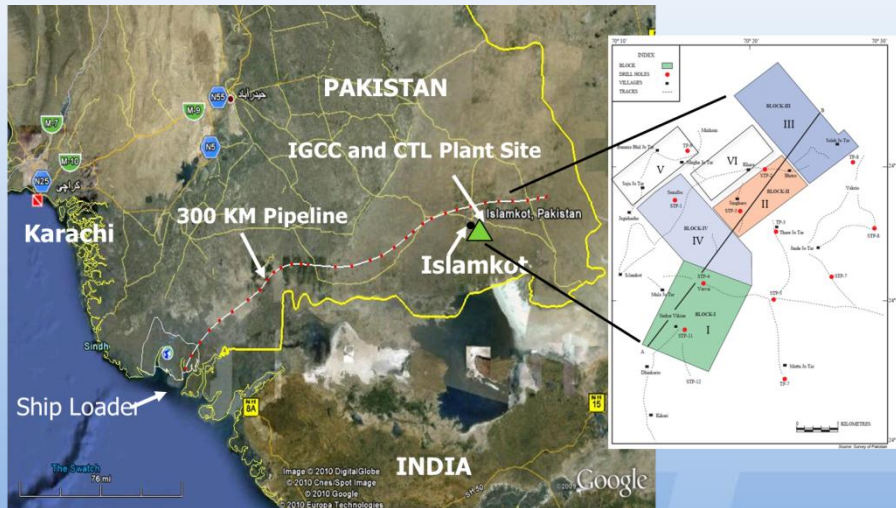
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India Coal Imports





# Thar Coal Field



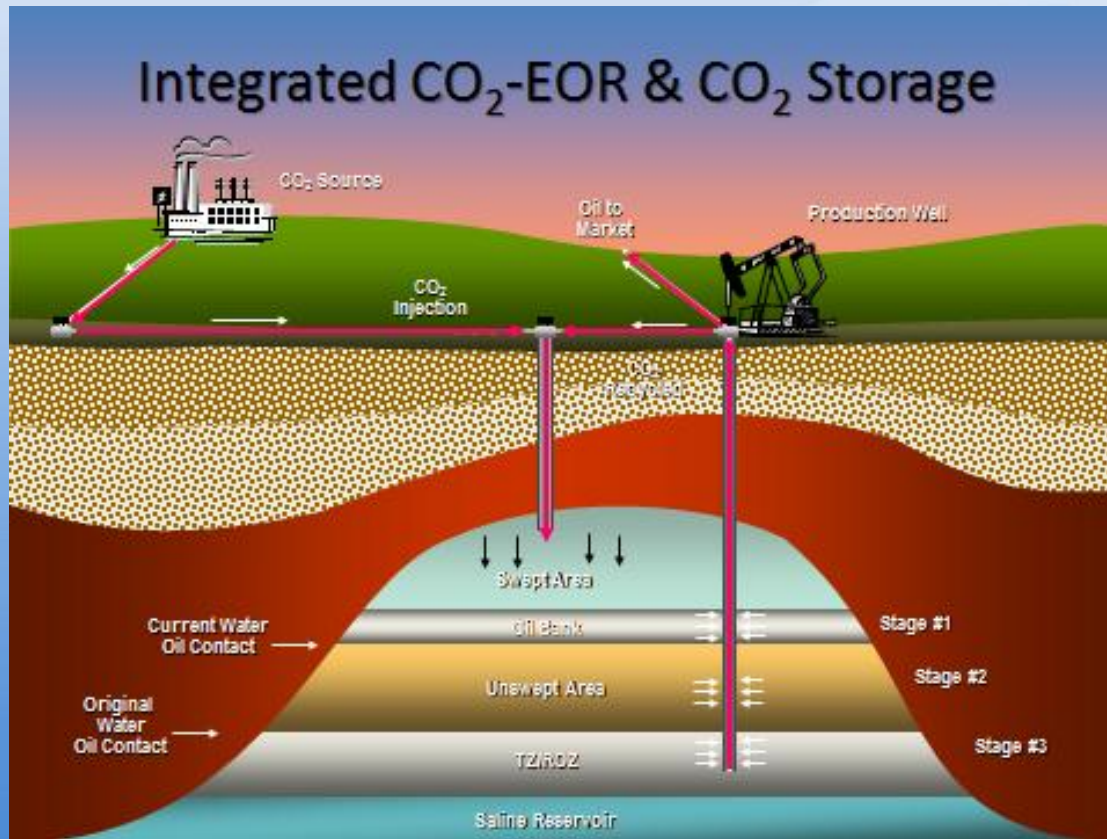
- USGS discovered the resource in 1993
- Estimated at 172 Billion Tons
- 2010 World Bank ban on coal projects
- First mover advantage – sitting idle
- Initial control >2 billion tonne resource
- Remarkable expansion capacity
- Potential to be the Powder River Basin of South Asia

# Environmental Importance of Thar

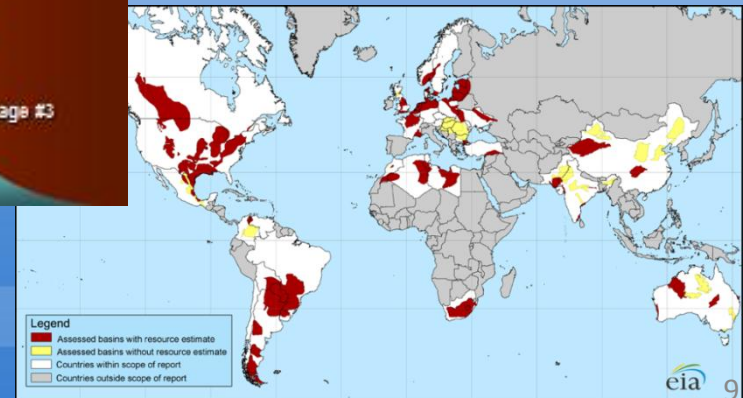
- Demand for expanded energy access is **overwhelming**
- The world **will** exploit Coal for decades and the bulk of the growth will be in developing nations
- Potential environmental consequences of **traditional** large scale coal development are real
- TharPak project can create a viable way forward to limit climate damage from coal development by **demonstrating the potential for advanced carbon capture technologies and mitigation of other pollutants from the production process.**
- TharPak can serve as “**proof of concept**” to replicate throughout the developing world to expand energy access while avoiding climate change and other forms of air pollution.



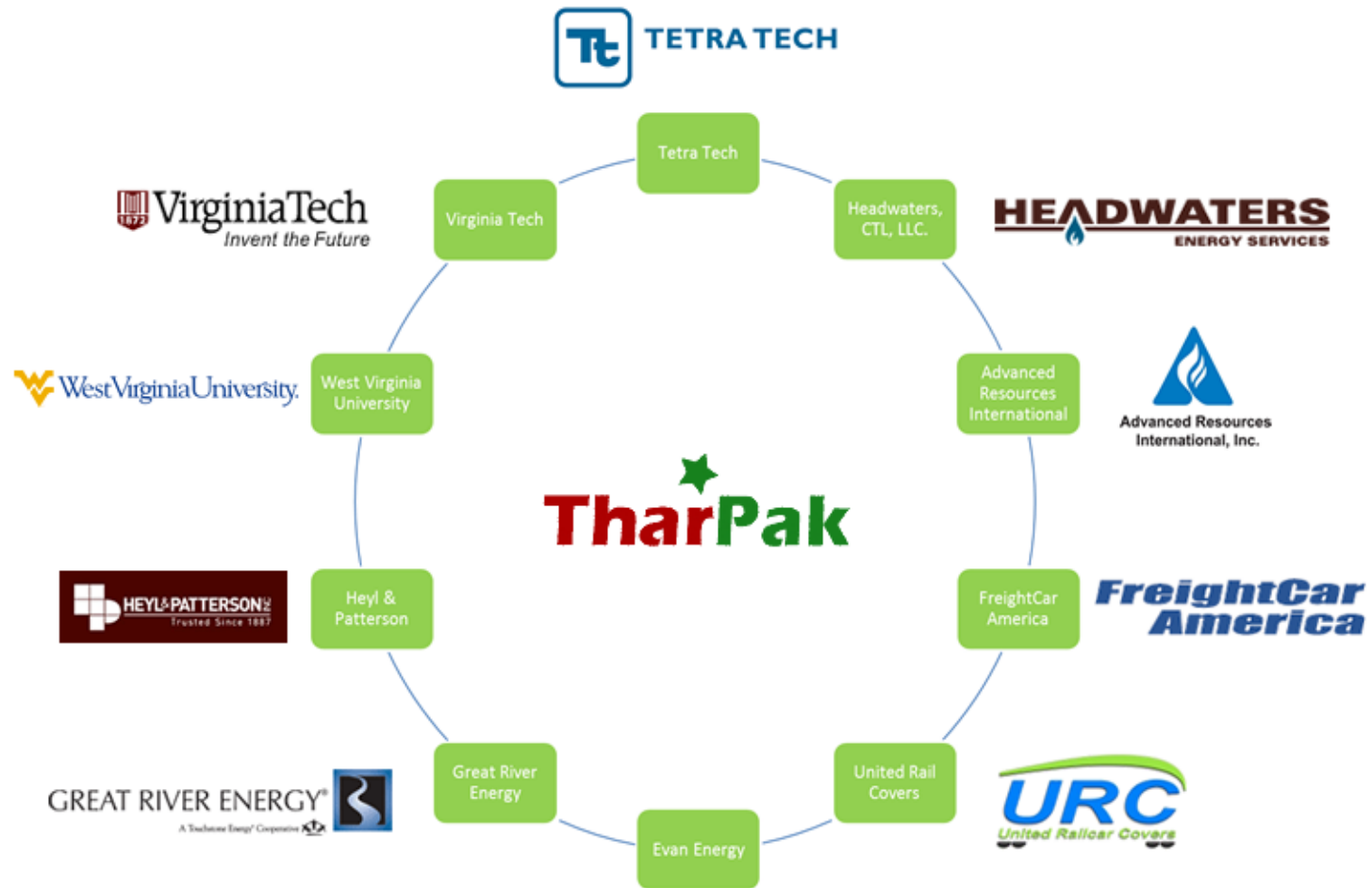
# CTL, CCS, EOR, & Emissions



Perfect Synergy:  
*EOR needs the CO<sub>2</sub> from CCS and CCS needs EOR to store the CO<sub>2</sub>*



# THE CONSORTIUM



# TharPak Advisors

**E. Morgan Massey** - Director Inter-American Coal, former CEO Massey Energy

**Dr. Stanley C. Suboleski** - Director Inter-American Coal, former executive Massey Energy Company & OKD Coal, former Department Head of Mining Engineering at VT & PSU

**Dr. Michael Karmis** - Professor Department of Mining and Minerals Engineering and Director of the Virginia Center for Coal and Energy Research at Virginia Tech

**Dr. W. Harrison Wellford** - energy advisor to three US Presidents, policy analyst and clean coal advocate

**Dr. Timothy R. Carr** – Energy & Geology Professor at WVU, The National Research Center for Coal & Energy and U.S.-China Energy Center

**Usman Aminuddin** - Chief Executive of Attock Refinery and Pakistan Oil Fields. Pakistan's former Federal Minister of Petroleum and Natural Resources

**Kamal Chinoy** - Director and CEO of Pakistan Cables Ltd., International Industries Ltd., Pak Chemicals Ltd., International Steels Ltd., Pakistan Security Printing Corp. Ltd. and Atlas Insurance Company Ltd

# Mega Energy Complex - Ultimate Objective



Truck & Shovel



Bucketwheel Excavator



Dragline

20M TPY Feed ← 59M TPY Output → 39M TPY Feed

80,000 BPD  
Ultra Clean  
Liquid Fuels



CO<sub>2</sub>(6.4M)

39.8M TPY of CO<sub>2</sub>

600 MW  
Captive  
Usage



IGCC Power  
Plant

5,400 MW  
Industrial &  
General  
Consumers



CO<sub>2</sub> (33.4M)  
CO<sub>2</sub>  
Compression &  
Transfer Plant

# Thank You

*ígracias*    *благодаря*    *děkuji*    *tak*    *tack*

*dank u*    *kiitos*    *merci*    *danke*

*σας ευχαριστώ*    *köszönöm*    *شكرا*    *ačiū*

*takk*    *dziękuję*    *obrigado*    *grazie*

*teşekkür ederim*    *շնորհակալություն*

Information: <http://www.tharpak.com>