Coal in the 21st Century

Just Transitions and Industry Transformation:
An Encouragement to See Change.

Panel on Just Transition
32nd session of the UNECE Committee on Sustainable Energy,
15 September 2023, Geneva
Who

David O. Jermain  |  Senior Fellow
Institute for Global Sustainability  |  Boston University

Boston University

Senior Fellow — Institute for Global Sustainability — 2022 - Present
Associate Director — Institute for Sustainable Energy — 2019 - 2020
Adjunct Professor — Questrom School of Business — 2018 - 2020
Research Scientist — Institute for Sustainable Energy — 2017 to 2018
Senior Fellow — Institute for Sustainable Energy — 2017, 2021

Recent Advisory Roles

Distinguished Associate — Energy Futures Initiative — 2017-2020
Advisor/writer for US DOE Quadrennial Energy Review 1.2 — 2016-2017
A clear (valid) definition of the situation is a must.
Are we right about the definition of the situation with coal transitions?
"We’re Investing."
“Because it’s undervalued.”
Undervalued how?

2011 — ~$1.27 trillion USD.
2020 — ~$500 billion USD.
2023 — ~$600 billion USD.

In 12 years, market value is eroded by ~50%.

Surely, there is more value in coal than “buy low/sell high”
That was then...
The transit to something new...
Could this be now?

Coal as a Multi-Resource Platform
<table>
<thead>
<tr>
<th>Leverage Mining Lands</th>
<th>Refine Extracted Coal</th>
<th>Harvest from CBM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Project developed + operations)</td>
<td>(Add circuits to core coal processing)</td>
<td>(Chemical and other new processing)</td>
</tr>
<tr>
<td>• Solar and wind</td>
<td>• Purified coal powder</td>
<td>• Hydrogen</td>
</tr>
<tr>
<td>• Pumped storage produced power</td>
<td>• Activated carbon</td>
<td>• Carbon nanotubes</td>
</tr>
<tr>
<td>• Geothermal energy</td>
<td>• Minor and trace elements, e.g., rare earths, cobalt, lithium</td>
<td>• Polymers</td>
</tr>
<tr>
<td>• Water for agriculture</td>
<td>• Carbon nanotubes all the way to graphene production onsite</td>
<td>• Starches</td>
</tr>
<tr>
<td>• Reclaimed lands for various uses — from agriculture to recreation</td>
<td></td>
<td>• Ammonia / fertilizer</td>
</tr>
<tr>
<td>• Deep shaft carbon sequestration</td>
<td></td>
<td>• Graphene production onsite</td>
</tr>
<tr>
<td>• Microalgae production</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Unique Advantages

Incremental development at low cost

- In-place infrastructure
- First mover advantage
- Established workforce
- Supportive communities
Premise

It’s easier to phase out coal-as-fuel if new coal value is created while doing so.
Thank You

Thanks to friends and colleagues in the crafting of these ideas:
Raymond C. Pilcher; Z. Justin Ren, Associate Professor, Questrom School of Business, BU; Eugene J. Berardi, Windward Catalyst; Scott B. Foster; and Benjamin Sovacool, Director IGS, BU