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August 6, 2019

MEMORANDUM

TO: Council Members

FROM: Mike Starrett

SUBJECT: End Goal Energy Planning

BACKGROUND:

Presenter: Melissa Powers, Lewis & Clark Law School

Summary: Melissa Powers is the Jeffrey Bain Faculty Scholar and Professor of Law and the Director of the Green Energy Institute at Lewis & Clark Law School.

Ms. Powers and her colleagues at the Green Energy Institute have written extensively about effective energy and climate policy, planning, and governance. The planning framework of starting with a measurable end goal in mind (e.g. reliability, GHG reductions, cost, etc.) is timely to consider as the Council finalizes the list of scenarios and anticipated performance metrics for the development of the 2021 Plan.

Ms. Powers will present the framework of end goal energy planning to the Council and will be available to answer questions from the Council Members.

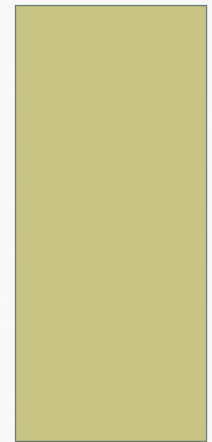
More Info: https://law.lclark.edu/centers/green_energy_institute/

Workplan: Prepare for 2021 Power Plan

END-GOAL ENERGY PLANNING

MELISSA POWERS

JEFFREY BAIN FACULTY SCHOLAR & PROFESSOR OF LAW, LEWIS
& CLARK LAW SCHOOL

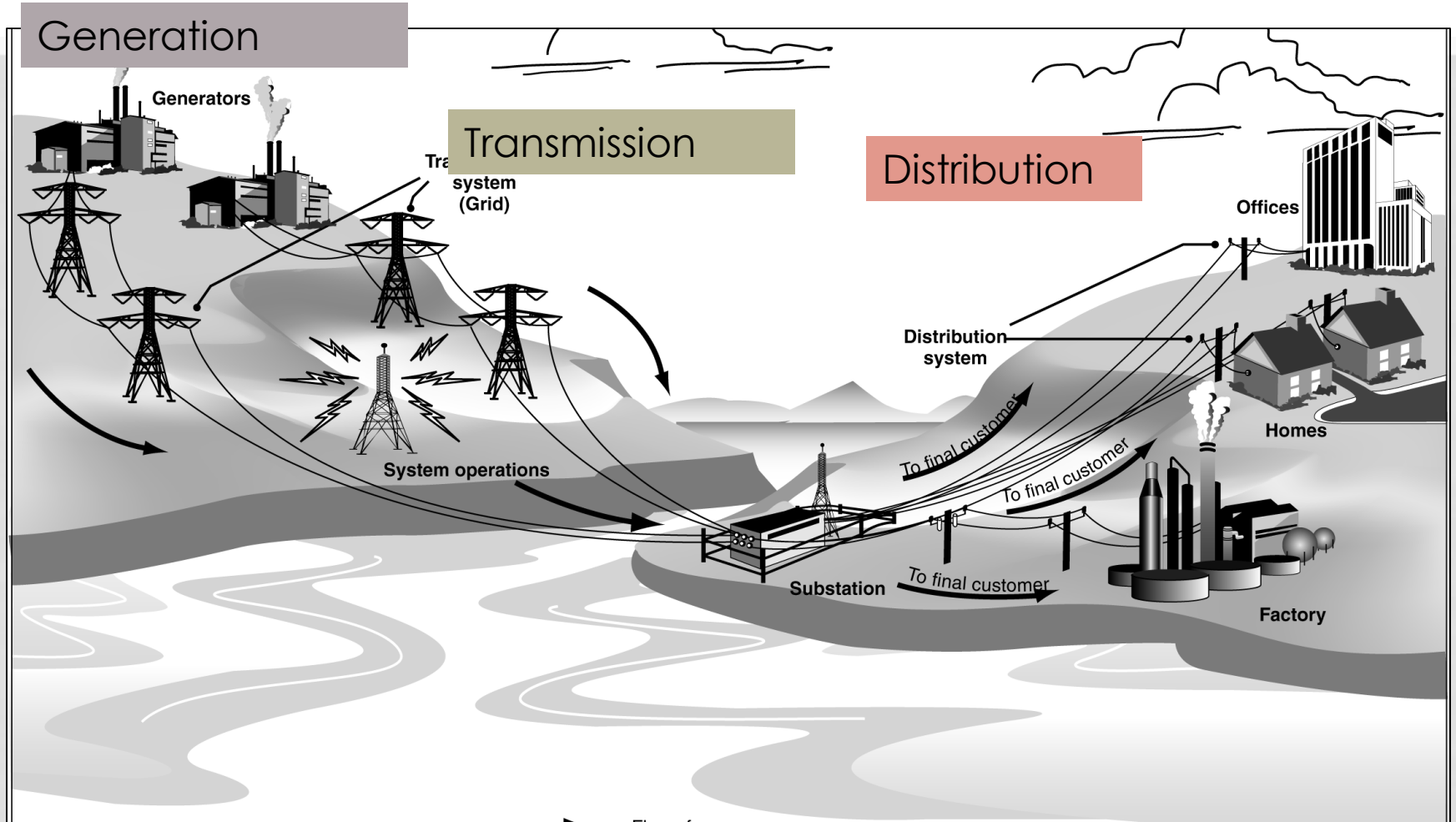


OVERVIEW

- Technological innovations, policy changes, and environmental/climate concerns are accelerating energy-system transformation
- Our approach to energy planning, with its focus on incrementalism and least-cost resources, is likely to be too slow and reactive, rather than proactive
- Incrementalism creates risks
 - Delayed decarbonization
 - Regulatory and investment uncertainty
 - Stranded costs and/or bad investments
 - Loss of faith in institutions
- We know what the end goal must be; we should plan to get there

OUR CHANGING ~~ELECTRICITY~~ ENERGY SYSTEM

THE GRID OF THE PAST



THE GRID OF THE FUTURE

The GoG: A “Grid-of-Grids”



**An Interconnected Power System Balancing
Forecasted Resources with Dispatchable Loads**

Source: “The Future of the Electric Grid and the Role of Energy Storage” Electric Power Research Institute, May 24, 2016

THE NEED FOR ACCELERATED
DECARBONIZATION/ENVIRONMENTAL
PROTECTION

GREENLAND THIS SUMMER

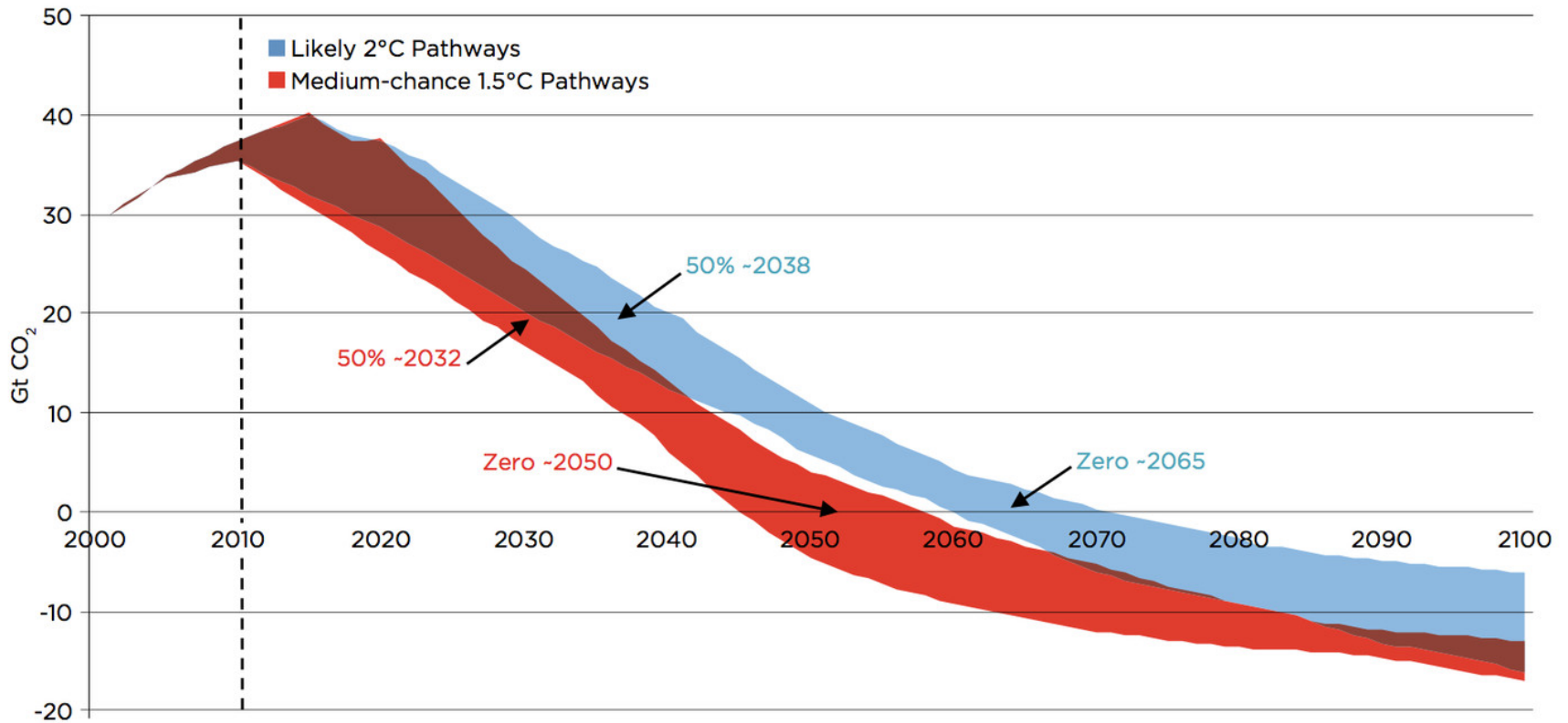
12.5 billion
tons in
a day



Source: Inside Climate News (2019)

THE 1.5°C PATHWAY

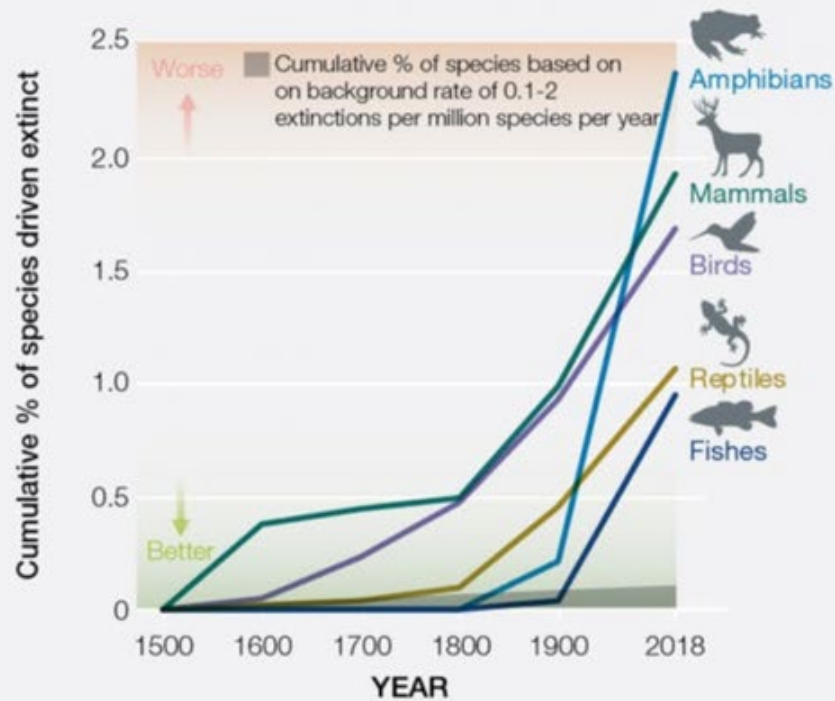
Figure 1: Range of Global Emissions Pathways in Scenarios Consistent with Likely Chance of 2°C or Medium Chance of 1.5°C¹⁸



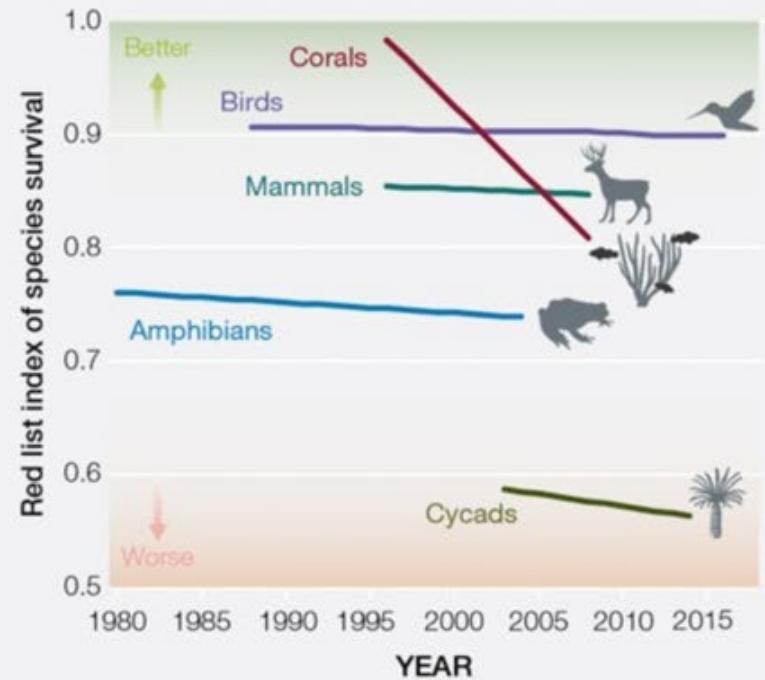
Sources: Joeri Rogelj et al

SPECIES IN PERIL GLOBALLY . . .

B Extinctions since 1500



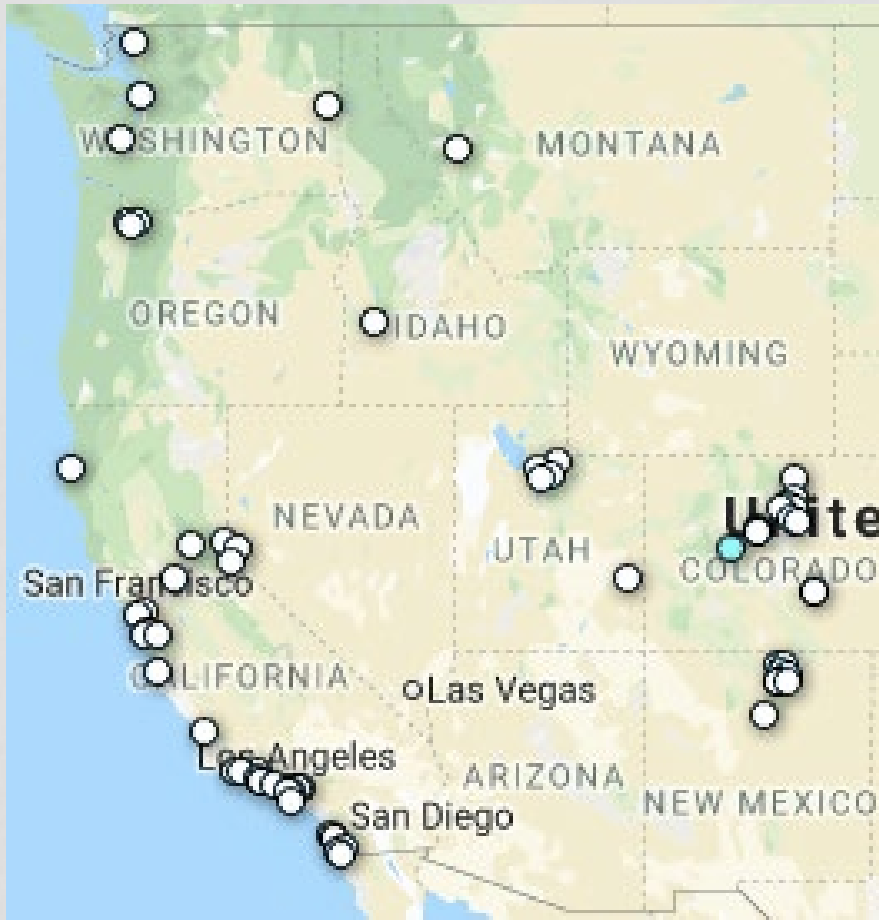
C Declines in species survival since 1980 (Red List Index)



... AND IN THE PACIFIC NORTHWEST



POLICY TRANSFORMATION



100% Renewable/Clean Targets:

States

- California: 100% Renewable Electricity by 2045
- Nevada: 100% Clean Energy by 2050
- Washington: 100% Clean Electricity by 2045

Counties/Cities

- Portland/Multnomah: 100% Renewable by 2050
- Boise: 100% clean, renewable electricity by 2035
- Missoula: 100% clean, renewable electricity by 2030
- Spokane: 100% clean, renewable electricity by 2030

POLICY WHIPLASH

The New York Times

U.S. Significantly Weakens Endangered Species Act

**Proposed to
Repeal** Job-Killing
"Clean Power Plan"
Keeping Energy Prices Low and Saving American Jobs

statesman journal
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HOME NEWS POLITICS SPORTS LIFE OUTDOORS THINGS TO DO USA TODAY OPINION OBITUARIES



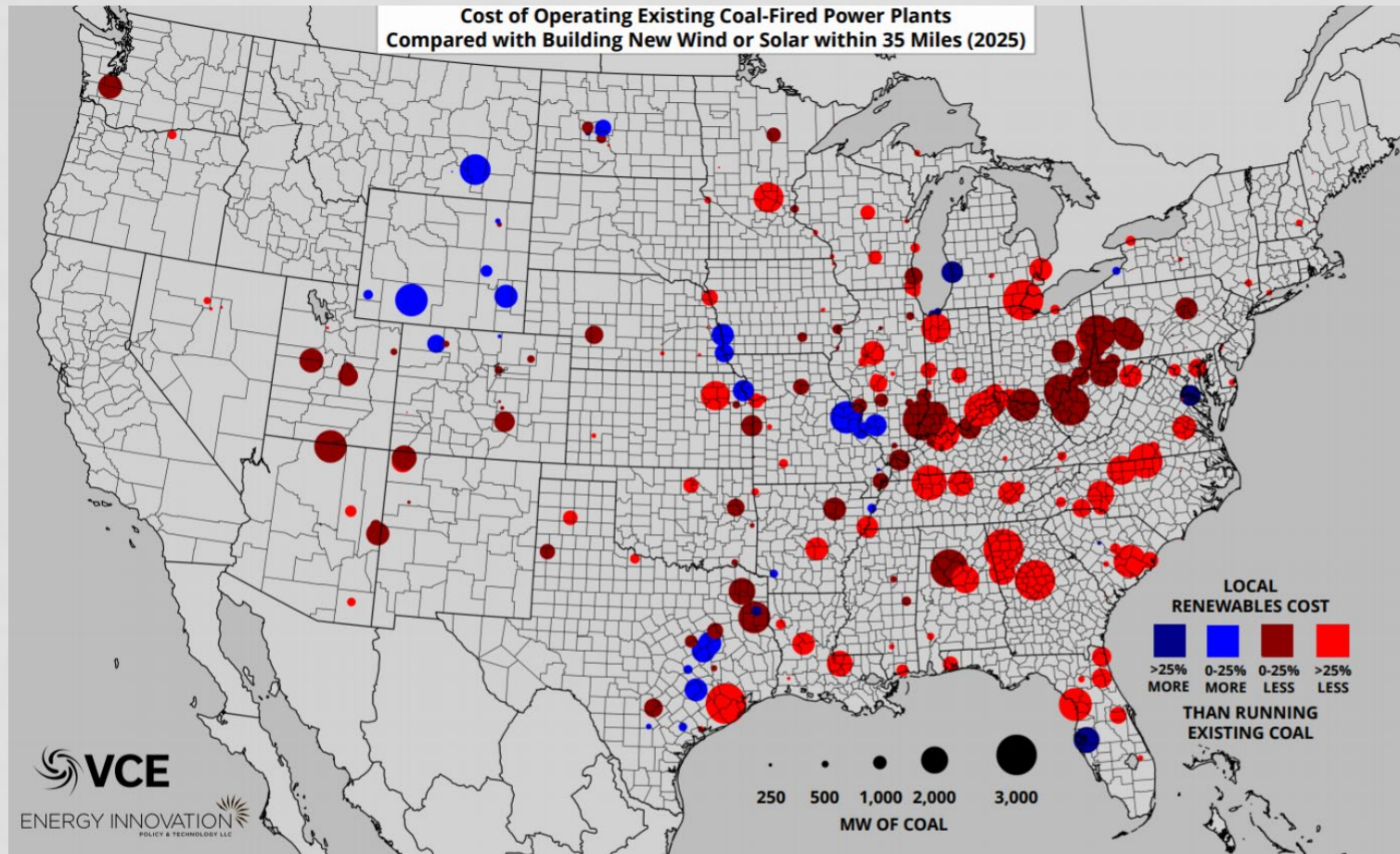
500 DAYS OF
AMERICAN
GREATNESS

Republican walkout came during perfect storm, sets stage for new political era

Connor Radnovich, Salem Statesman Journal Published 6:00 a.m. PT July 15, 2019 | Updated 7:11 a.m. PT July 16, 2019



CHANGING ENERGY ECONOMICS: UNECONOMIC COAL



CHANGING ENERGY ECONOMICS: RENEWABLES V. GAS

electrek ▼



Automakers ▼ Alt. Transport ▼ Autonomous Driving ▼ Energy ▼

JUNE 24

GE gas plant to close 20 years early, become battery storage site — sign of the times?

Phil Dzikiy - Jun. 24th 2019 10:59 am ET [@phildzikiy](#)

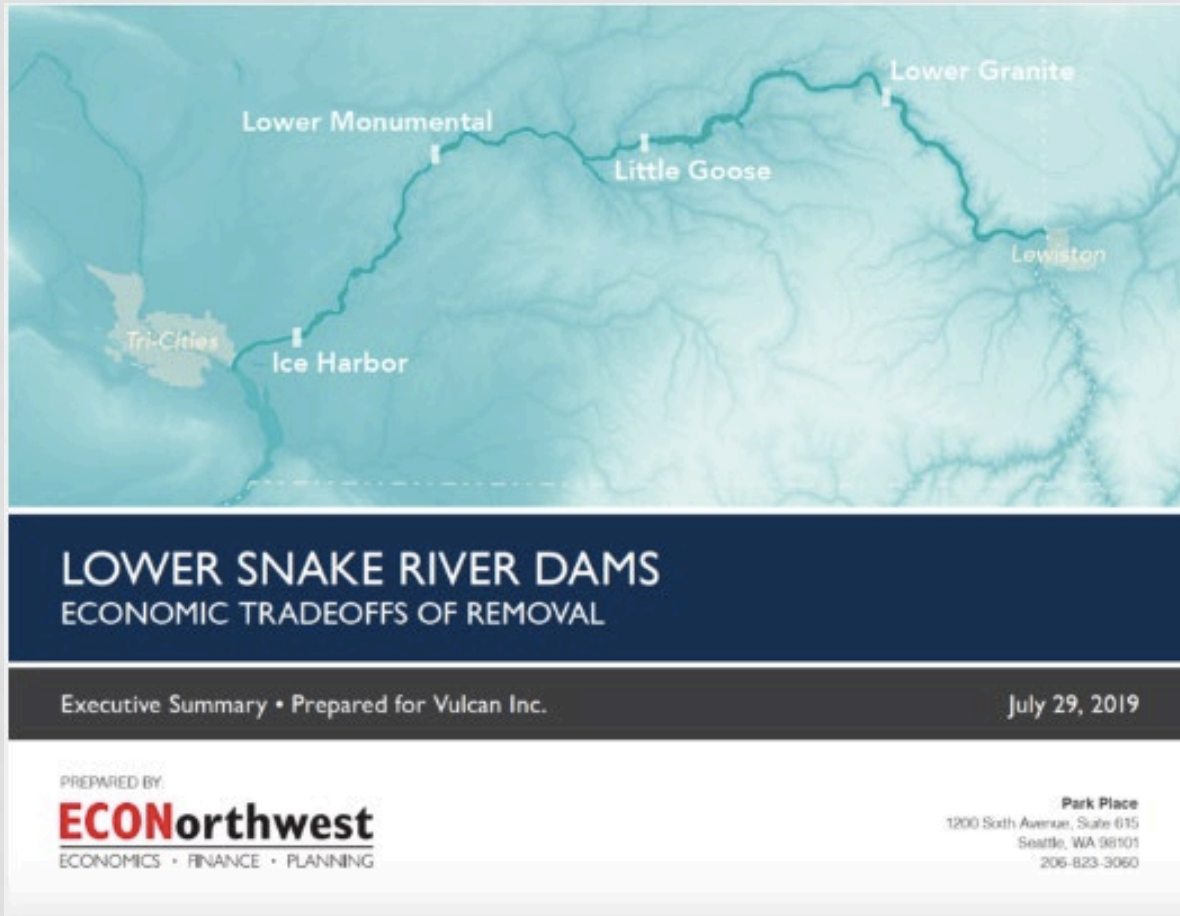
Renewable Energy Continues to Be Cheaper Than Natural Gas and Coal

JESSE BROEHL
JAN 02, 2019

NAVIGANT
RESEARCH



CHANGING ECONOMICS: THE DAMS



ENERGY INCREMENTALISM

WHY INCREMENTALISM SEEMS TO MAKE SENSE V. WHY IT DOESN'T

Pro-incrementalism

- Who knows what the future will bring?
- Allows adjustments to strategy and investments
- Prevents investment lock-in
- Long-term planning is very hard with so much in flux

Anti-incrementalism

- We are in control of what our energy system should look like
- Adjustments will happen under either system, but adjustments linked to end goals will head in the right direction
- Lock-in happens under existing model – stranded costs
- Long-term planning IS hard, but it's the only way to get where we need to be

INCREMENTALISM SO FAR

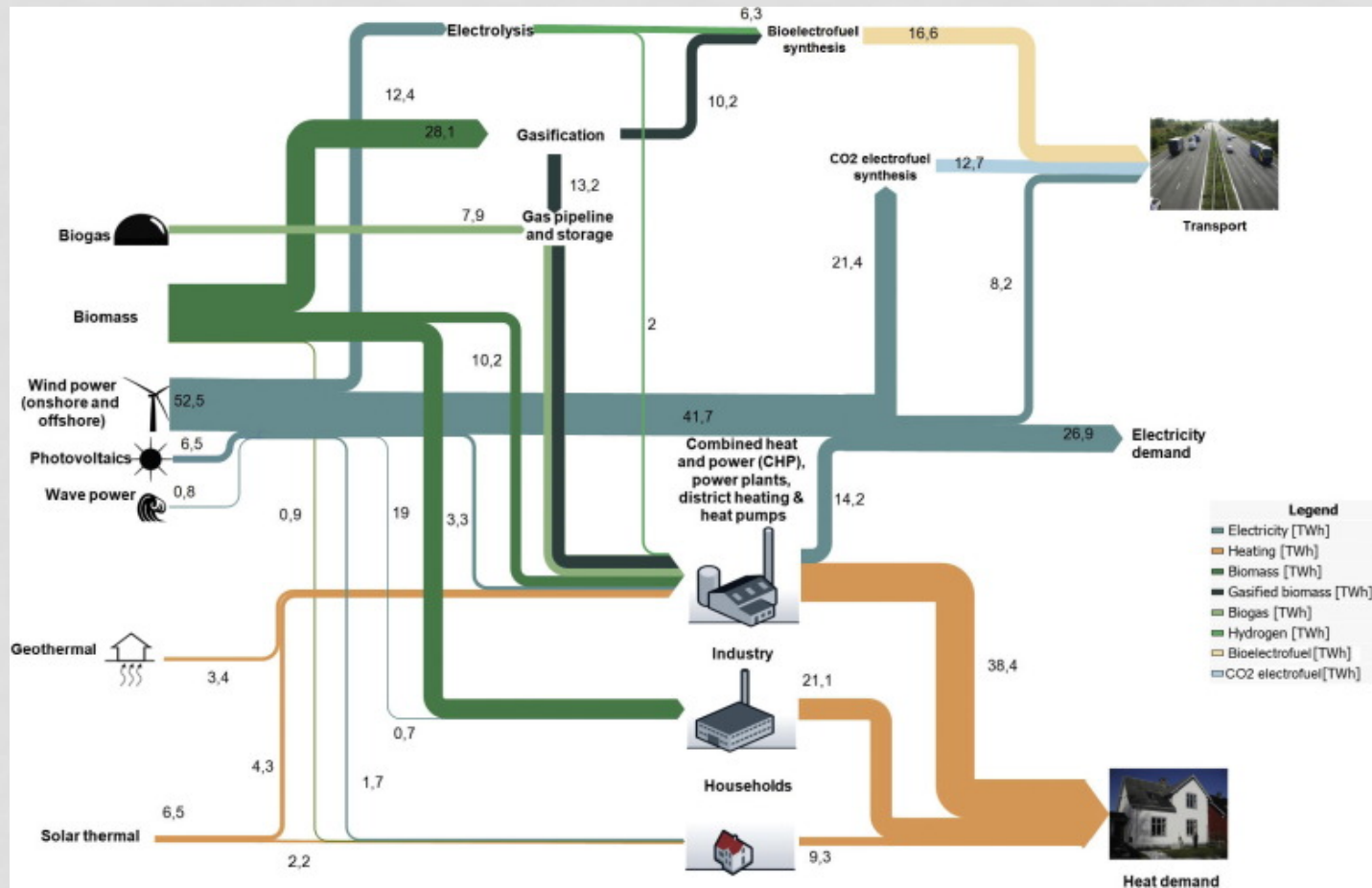
- We are not planning for a decarbonized energy system, a “grid-of-grids,” beneficial electrification, or any of the other future energy systems we need
- Emissions are increasing
- Conflicts between energy resources and producers proliferate
- Stranded cost concerns are delaying decarbonization

END GOAL ENERGY PLANNING

END-GOAL PLANNING

- Select End-goal Targets
 - 100% carbon-free energy
 - Net-negative GHG emission reductions, by mid-Century
- Design the Blueprint
- Strategic Planning to Select and Implement Pathways of the Blueprint
 - Coordinated government structure and strategy
- Policies/Sustained Funding to Implement Strategies
- Monitoring, Evaluation, Adaptation – To Meet the End-goal Targets

DENMARK'S EXAMPLE



QUESTIONS? COMMENTS?