Agenda

- Climate Solutions
- Climate Imperative
- Climate Movement
- Stop Making It Worse
- Bright Future
- Q & A
Climate Solutions Mission

Accelerate *practical, profitable* solutions to global warming by:

- ✔ Galvanizing leadership
- ✔ Growing investment
- ✔ Bridging divides

**GOAL:** Make the Northwest a national and world leader in the clean energy economy
Unbroken Pattern of Warming

GLOBAL LAND-OCEAN TEMPERATURE INDEX

Data source: NASA’s Goddard Institute for Space Studies (GISS).
Credit: NASA/GISS
What’s Holding Us Back?

How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming

Merchants of Doubt

Naomi Oreskes & Erik M. Conway

Nick Naylor doesn’t hide the truth... he filters it.

THANK YOU FOR SMOKING

Based on the best-selling novel

SPRING 2006

© 2006 Twentieth Century Fox Film Corporation. All Rights Reserved.
Fossil Fuel Industry Thwarts Progress

Koch Industries: Secretly Funding the Climate Denial Machine

The Koch Brothers have sent at least $79,048,951 to groups denying climate change science since 1997.

Greenpeace uses 1997 as a benchmark year due to increased coordinated backlash against global climate negotiations leading to the Kyoto Protocol of 1998. We define climate change denial as “anyone who is obstruction, delaying or trying to derail policies that are in line with the scientific consensus that says we need to take rapid steps to decarbonize the economy.”

Secret funding helped build vast network of climate denial thinktanks

Anonymous billionaires donated $120m to more than 100 anti-climate groups working to discredit climate change science

How Donors Trust distributed millions to anti-climate groups

Climate sceptic groups are mobilising against Obama’s efforts to act on climate change in his second term.

Photograph: Justin Sullivan/Getty Images
But It’s Not Working Anymore
"You won't find [climate change skeptics] on the fire line in the American West anymore."

Tom Boatner, Chief Fire Operations, BLM July 2013
Once the canary in the coal mine, now the oyster in the ocean
Climate Movement
Climate Resistance
A Moral Awakening

Laudato Si’
On Care for Our Common Home

POPE FRANCIS
Paris Agreement
Shell No(t necessary)

“[I]n the world where we burn Arctic Oil, the Port [of Seattle] - - and coastal cities everywhere - will sink under rising, acidified oceans” - KC Golden, Policy Advisor, Climate Solutions
Stop Making It Worse

- The make or break issue: Energy infrastructure decisions in growing economies can’t lock in carbon emissions for decades to come.
Carbon Bubble

Unburnable fossil fuels

Known, extractable coal, oil and gas reserves that must not be burnt in order to prevent dangerous climate change of more than 2°C

Global reserves
Per cent that cannot be burned

Coal: 82%
Gas: 49%
Oil: 33%

No to Coal and Oil
coal transportation in the Pacific Northwest

- proposed coal terminals
- killed projects
- projects in litigation
- train routes
- coal-bearing ship
- coal-bearing train
oil transportation in the Pacific Northwest
Keystone Principle

“If we're gonna prevent large parts of this Earth from becoming not only inhospitable but uninhabitable in our lifetimes, we're gonna have to keep some fossil fuels in the ground.”

President Obama on why he rejected the Keystone XL Pipeline, Nov. 6, 2015

#KeepItInTheGround
Getting Off Coal
Clean Power

- Energy Efficiency: The less we use, the less we need to extract or build
- Coal to Clean: Remove coal from grid by 2035
- Limit Natural Gas: Only a limited bridge from coal to clean energy
- Renewable Energy: Distributed and utility-scale
- Utility of the Future: Smart grid, generation, transmission, and new business model
Getting to 100% Renewables

ASSESS BASELINE ELECTRICITY USAGE

PURSUE ENERGY EFFICIENCY MEASURES

- Building Retrofits
  - LEDs
  - HVAC/Heat Pumps
  - Energy Management Systems
  - Insulation
  - Double-/Triple-Pane Windows
  - Efficient Machinery

- Demand Response/Smart Appliances
  - Smart Thermostats
  - Smart Meters and Connected Devices

- Net Zero Buildings (New Construction)

DEPLOY CLEAN ENERGY

- Onsite Renewables (Lease or Own)
- Utility Scale Renewables (PPA)
- Community Solar
- Renewable Energy Certificates (RECs)
- Utility Green Power Programs & Green Energy Tariffs
- Third-Party Clean Energy Offerings (IPP)
- Energy Mix of Regional Operations

BALANCE, WHERE NEEDED, WITH ENERGY STORAGE

- Distributed Storage
- Large-Scale Storage

Source: Clean Edge research
Energy Efficiency - The First Solution

The economy-wide Energy Intensity Index excludes structural factors (e.g., decline of energy-intensive industries) and reflects changes in energy intensity associated with energy efficiency.

Energy Efficiency Resource Standards

[Map showing states with energy efficiency resource standards and goals]

Renewable Portfolio Standards

Clean Energy, Coal Transition Act
# Getting to 100% Renewables

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>GEOGRAPHIES COVERED</th>
<th>TARGET DATE</th>
<th>INTERIM DATE</th>
<th>MOST RECENT REPORTED %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>Global</td>
<td>Long-term; Not Specified</td>
<td>50% by end of 2018</td>
<td>21% (2014)</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>Global</td>
<td>2020</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Google</td>
<td>Global</td>
<td>Long-term; Not specified</td>
<td>N/A</td>
<td>37% (2014)</td>
</tr>
<tr>
<td>IKEA</td>
<td>Global</td>
<td>2020</td>
<td>N/A</td>
<td>59% (2014)</td>
</tr>
<tr>
<td>Mars</td>
<td>Global</td>
<td>2040</td>
<td>Reduce fossil fuel energy use by 25% by 2015</td>
<td>N/A</td>
</tr>
<tr>
<td>Nike</td>
<td>Global</td>
<td>2025</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Salesforce</td>
<td>All data centers</td>
<td>Long-term; Not Specified</td>
<td>N/A</td>
<td>43% (2015)</td>
</tr>
<tr>
<td>Starbucks</td>
<td>Global</td>
<td>Long-term; Not Specified</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Walmart</td>
<td>Global</td>
<td>Long-term; Not Specified</td>
<td>Produce or procure 7 billion kWh of renewable electricity globally by 2020</td>
<td>26% (2014)</td>
</tr>
</tbody>
</table>

Source: Clean Edge research. Note: Clean Edge makes no claim to the logos in the above table. All trademarks are the property of the respective companies.
Getting Off Oil

CLEAN FUEL & TRANSPORTATION
Moving Beyond Oil

- Transportation largest source of carbon pollution: 46% in Washington and 36% of Oregon
- Oil use declining with more efficient vehicles using less gas, people driving less, and vehicles using lower carbon fuels
- 2025 vehicles use half as much fuel to go the distance they went in 2011
- Half the oil by 2030
  - VMT reduction
  - Cleaner fuels, including electricity
  - Compact, transit-centered communities
Oil Can’t Compete with Renewables

National Bank of Abu Dhabi: While fossils have been heart of energy investment for past decades, future dollars will flow primarily to renewables
Fossil Fuels Losing Race Against Renewables

“Fossil Fuels Just Lost the Race against Renewables” April 14, 2015
Sustainable Advanced Fuels

- Scaling low-carbon, sustainable and cost-effective alternatives to petroleum in transportation sector:
  - Electric Vehicles
  - Biojet
  - Biofuels
  - Renewable Natural Gas
Clean Energy Economy

- Clean Trillion: Tremendous clean energy investment opportunity
- Economics of Renewables: Rapidly falling costs; dramatic adoption of renewable energy
- Economic Development: Clean jobs are eclipsing fossil fuel jobs
Record Investment in 2015

NEW INVESTMENT IN CLEAN ENERGY
2004-15 ($BN)

- Total annual new investment in clean energy. This includes all asset classes in all clean energy sectors.

Note: Total values include estimates for undisclosed deals. Includes corporate and government R&D, and spending for digital energy and energy storage projects (not reported in quarterly statistics).

Source: Bloomberg New Energy Finance
Green Bonds Surging

ANNUAL HISTORICAL GREEN BOND ISSUANCE, BY TYPE, 2007-15 ($BN)

Notes: (1) The funds raised by green bonds are neither entirely inclusive nor exclusive of figures for clean energy asset finance. (2) ‘Corporate’, ‘sovereign, supranational and agency’ and ‘US municipal’ include only bonds explicitly labelled as green and which meet the criteria for receiving a green bond ‘tag’ on the Bloomberg Terminal. (3) ‘Project’ includes bonds backed by the cash flows of an underlying renewable energy project or portfolio of projects. (4) ‘ABS’ includes asset-backed securities whose cash flows come from a portfolio of underlying receivables such as loans, leases and PPAs where the receivables are associated with green (eg, renewable energy, energy efficiency) projects.
Investment Up – Costs Down

Plummeting Price of Solar

Exhibit 2
Welcome to the Terrordome... $/MMBTU by Energy Type

Source: EIA, CIA, World Bank, Bernstein analysis
Explosive Growth of Wind & Solar

Less Money Purchasing More RE

What a difference three years can make:
Renewable generation in California on two days of similar weather

City Pathways
Urban Clean Energy

- Unique and critical role of cities: ½ the world and 80% of Americans in cities—70% of global carbon emissions
- Energy Efficiency
- Local Distributed Renewable Energy
- Electricity Grid Innovation
- Clean Transportation
City-Led Clean Energy Innovation

- 100 Percent Renewable Cities
- Carbon Neutral Cities
- New Energy Cities
Bright Future: Clean Energy Transition is Accelerating.

YOUR FUTURE IS SO BRIGHT
YOU GOTTA WEAR SHADES
Subscribe to ClimateCast!

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions

CLIMATECAST
The Week in Clean Energy Solutions
Thank you

Eileen V. Quigley
Director of Strategic Innovation

eileen@climatesolutions.org
206.443.9570 x 34 (office)
206.579.9644 (mobile)