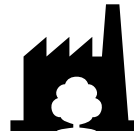
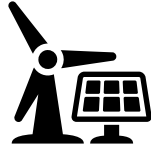


RENEWABLE ENERGY SUPPLY



To: Low-Carbon Energy Supply Leaders
Subject: Your Negotiating Goals in “World Energy”

Welcome to the global climate and energy policy conference. As leaders of the low-carbon and renewable energy industries, you will make decisions regarding global energy supply over the coming decades.

Your group includes representatives of the low-carbon and renewable energy industries—hydro, wind, solar, bioenergy, geothermal, and yet-to-be developed zero-carbon energy technologies. This group includes established energy companies, start-ups, electric utilities, and firms that supply these industries.

Together with other leaders, your goal is to limit global warming to no more than 2°C above pre-industrial levels, while also meeting the needs of your stakeholders.

As a group, you will:

1. **Decide on** taxes and subsidies for solar, wind, and bioenergy.
2. **Decide whether to invest in the development of** a breakthrough zero carbon energy technology that would be inexpensive and able to scale rapidly in the coming decades.
3. **Advocate for or against** the *Carbon Pricing* group setting a price on carbon emissions and where the revenue will go.
4. **Lobby and negotiate with** the other parties to encourage them to take actions to meet your shared climate goal and help the industries and firms you represent.

The best available science shows that greenhouse gases (GHGs) emitted by human activity are already changing the climate, that the risks of further climate change to our economy and to human welfare are serious and that avoiding the worst impacts is possible. The internationally agreed upon goal is to limit the increase in global average temperature to well below 2°C above preindustrial levels. Warming above this level threatens the economy and human welfare of all nations.

While you represent new energy supply technologies, the world economy today is dependent on fossil fuels. Cutting fossil fuel use may be costly to consumers and the economy in the short run. However, limiting warming to below 2°C means a large fraction of known fossil fuel resources must remain in the ground permanently. For governments and firms that rely heavily on fossil fuels, a transition to a low-carbon economy will require shifts in infrastructure, business models, resources, and investments. In some cases there may be business losses.

Investing in new capabilities and shaping policy and regulations would be advantageous to your industry. To that end, you are actively exploring how you might use your financial capital, your expertise, and society’s existing infrastructure to compete in a changing world. Policy interventions, like subsidies, could help. However, securing high levels of government spending anywhere is difficult given economic and political uncertainty.

Many trends point in the direction of opportunities within your sector to increase production of low carbon, renewable energy:

- From 2009 to 2016, wind costs fell 50%.
- The cost of solar photovoltaic modules has fallen 80% since 2008.
- The World Bank no longer funds construction of new coal-fired power plants.
- Some oil companies (e.g., Total and Statoil) are investing heavily in renewable energy.
- Growth in coal use in China decreased from 9.4%/year to 2.8%/year between 2011 and 2012.

World Energy role play simulation developed by Climate Interactive, MIT Sloan School of Management, and UMass-Lowell. Last updated March 2019.

Despite these trends, it will take years for renewable energy sources to become dominant, especially if fossil fuels, like coal, oil, and gas, remain unrestricted. Directly taxing individual fossil fuels and/or a high price on carbon may be needed to reduce emissions and allow your energy companies to flourish.

Notes on actions:

1. **You can propose policies to tax or subsidize renewable energy, bioenergy, and nuclear** to promote the development of an energy supply system that limits climate damage.
2. **You can invest in research and development for a breakthrough, low-cost zero-carbon energy source.** The most likely source would be Thorium fission, as advocated by Bill Gates.
3. **Take a position on carbon pricing.** A carbon price would harm carbon-intensive energy production by cutting demand for fossil fuels, increasing costs, and decreasing shareholder value for firms heavily dependent on fossil fuels, at least in the near term. A carbon price could also create profit opportunities for low-carbon, renewable sources, bring capital into startups in these areas, and stimulate innovation, or it could be redirected to citizens.
4. **Lobby and negotiate.** Other groups have the ability to take action that can mitigate climate change. Although CO₂ from fossil fuel use contributes the most to climate change, other gases, including methane (CH₄) and nitrous oxide (N₂O), are potent GHGs, and their impact is growing. Global agriculture and forestry practices contribute greatly to emissions of these gases. The *Land & Agriculture* group can propose policies to reduce CH₄ and N₂O emissions that can help limit climate change. The *Energy Efficiency* group can invest in energy efficiency for buildings, industry, appliances and vehicles, saving money and increasing resilience while also reducing carbon pollution. However, the reductions in energy demand from greater efficiency may cut revenue and profit for energy generation and utilities.

US\$/ ton CO ₂	Examples of existing carbon prices
139	Swedish carbon tax
101	Swiss carbon tax
77	Finland carbon tax
64	Norway carbon tax (upper)
55	France carbon tax
36	Iceland carbon tax
29	Denmark carbon tax (fossil fuels)
27	BC carbon tax
25	UK carbon price floor
23	Alberta carbon tax
21	Slovenia carbon tax, Korea ETS
16	EU ETS
15	California CaT, Ontario, Quebec
9	Beijing pilot ETS
8	Portugal carbon tax, Swiss ETS
7	Shenzhen pilot ETS
6	Shanghai pilot ETS, Tokyo CaT, Colombia, Latvia
4	RGGI, Chongqing pilot ETS
3	Mexican carbon tax (upper)
1	Tianjin pilot ETS
<1	Poland carbon tax

World Bank, Ecofys (2018). *State and Trends of Carbon Pricing*