Energy Efficiency

To: Energy Efficiency Leaders
Subject: Your Negotiating Goals in "World Energy"

Welcome to the global climate and energy policy conference. As leaders of energy-intensive sectors of the economy, you will make decisions regarding improvements in energy efficiency and the electrification of new infrastructure and goods over the coming decades.

Your group includes the car and truck industries, airline industries, train industry, public transit authorities, industrial machinery and appliance manufacturers, energy efficiency incentive programs of electric utilities, residential/commercial builders, and the real estate industry.

You will make decisions regarding the energy efficiency of new products and infrastructure over the coming decades for transport, buildings, and industry. You have the ability to change the rate that energy efficiency improves every year. This is measured by how much decline there is in the energy it takes new capital to produce one dollar of GDP each year (known as: energy intensity). You also can enact increases in the adoption rate of things like electric cars and trains, as well as move toward things like electric heating in buildings and industry.

Your goal is to achieve the best outcome for the groups you represent.

As a group, you will:

1. **Decide** on the annual rate of energy efficiency improvements and electrification of new capital for both the transport sector and buildings and industry sector.
2. **Advocate for or against** the *Carbon Pricing* group setting a price on carbon emissions and where the revenue will go.
3. **Lobby and negotiate** with the other parties to encourage them to take actions that contribute to solving the climate change problem while improving the welfare of the people and groups you represent. Industry and individuals cannot be asked to bear all the costs of GHG reductions.

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.

You must balance the imperative to prevent dangerous climate change, however, with the needs of your key stakeholders, including the public (your customers, who become increasingly aware of energy efficiency), shareholders, employees, and the policymakers who provide your license to operate, regulate your industries and affect your operating costs.

The industries you represent developed in an era of inexpensive energy. Dramatically increasing energy efficiency would require substantial cultural change and new capabilities. Some of your key stakeholders, including the airline industry, shipping and freight industry, and large automakers, will be hurt by policies that require aggressive improvements in energy efficiency. Although in some sectors energy efficient products can be sold at a premium and generate good returns. Climate change impacts, including rising sea levels, more extreme weather, and geopolitical dislocations, may pose serious risks to the infrastructure your sector relies on.

Energy efficiency not only reduces energy demand, but can also improve society's resilience to climate-related disasters. Even without a concerted effort, the energy intensity of the economy (i.e., energy used per unit of real GDP) is currently decreasing at a rate of around 1.3% per year, a trend that is expected to continue over the coming decades. Your own analysts report that many energy efficiency projects have short payback periods and offer positive net present value over their useful lifetimes. Innovative financing

mechanisms, such as revolving funds, can use savings from lower energy costs to finance new energy efficiency projects, reducing the up-front cost barriers of these projects and making them financially attractive to stakeholders.

Many trends point in the direction of opportunities within your sector to increase energy efficiency:

- Energy intensity of new energy-using capital has been falling 1% per year but some think it could fall 5-7% per year (at some cost, and not in all industries).
- The International Energy Agency (IEA) has shown that energy efficiency across all sectors could save $1 trillion/year in energy costs and deliver "incalculable security benefits" in the forms of energy security and environmental and public health benefits.
- Between 2005 and 2010, advances in energy efficiency saved eleven developed nations from burning $420 billion worth of oil. Without those advances, the total energy consumption of those countries would have been 65 percent higher in 2010.
- After the Fukushima nuclear accident in 2011, Japan replaced half of its nuclear power with energy efficiency.
- Energy savings from residential customer information and behavioral feedback programs have reported 2-7% increases in energy efficiency.

Electrification has been pointed to as a way to get away from fossil fuels. An electric car, for example, does not need to run on oil, but it still must be charged, and the electricity must come from somewhere. Electric transport (at all scales) may be a key part of the transition, but it needs to be accompanied by strong policies to increase renewable energy.

Notes on actions:

1. **You can propose policies that boost the efficiency of new energy-using capital**, which slowly replaces the existing capital stock. A 7% per year improvement in the efficiency of new capital gives a 3.5% per year decrease in average energy intensity, a rate that some energy experts believe is possible. You will decide separately on energy efficiency improvement rates for transport and for buildings and industry.

2. **Take a position on carbon pricing**. Your economists acknowledge that internalizing the environmental and social costs of GHG emissions with a carbon price could be the best way to reduce global GHG emissions. A carbon price would harm carbon-intensive energy use, increasing costs and decreasing shareholder value for many of the firms you represent that are heavily dependent on fossil fuels, at least in the near term. However, a carbon price would create incentives for boosting energy efficiency. Carbon price revenue could also be used to help offset research and development and up-front costs your constituents need to finance energy efficiency projects. If there is a carbon price, consider the effect on your investments that are heavily reliant on fossil fuels (e.g., cars, trucks, real estate, and electric power industries), along with the potential to promote investment and profitability in technologies and systems that boost energy efficiency (e.g., electric vehicles, public transportation, building energy efficiency, and education and behavior change programs).

3. **Lobby and negotiate**. Your constituents should not be asked to bear the burden of limiting climate change. Other groups have the ability to take action that can mitigate greenhouse gas emissions and limit climate change. *Conventional Energy Supply* can tax fossil fuels and *Renewable Energy Supply* can invest financial capital into research and development for renewable energy and bioenergy. The *Land & Agriculture* group can propose policies to reduce CH_4 and N_2O emissions that can help limit climate change.

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*