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JUN 10, 2015

## The G-7 Embraces Decarbonization

NEW YORK – This week's G-7 meeting at Schloss Elmau in the Bavarian Alps marked a major breakthrough in climate-change policy. The seven largest high-income economies (the United States, Japan, Germany, the United Kingdom, France, Italy, and Canada) made the revolutionary decision to decarbonize their economies during this century.

For the first time in history, the major rich economies have agreed on the need to end their dependence on fossil fuels. German Chancellor Angela Merkel, US President Barack Obama, and the other G-7 leaders have risen to the occasion and deserve strong global approbation.

The historic breakthrough is recorded in the final [G-7 communiqué](#). First, the G-7 countries underscored the importance of holding global warming to below 2° Celsius (3.6° Fahrenheit). This means that the Earth's average temperature should be kept within 2°C of the average temperature that prevailed before the start of the Industrial Revolution (roughly before 1800). Yet the global warming to date is already around 0.9°C – nearly half way to the upper limit.

Then, the G-7 leaders did something unprecedented. They acknowledged that in order to hold global warming below the 2°C limit, the world's economies must end their dependence on fossil fuels (coal, oil, and natural gas).

Currently, around 80% of worldwide primary energy comes from fossil fuels, the combustion of which emits around 34 billion tons of carbon dioxide. This level of emissions, if continued in future decades, would push temperatures far above the 2°C upper limit. Indeed, with rising worldwide energy use, continued dependence on fossil fuels could raise global temperatures by 4-6°C, leading to potentially catastrophic consequences for global food production, higher sea levels, mega-droughts, major floods, devastating heat waves, and extreme storms.

The science is clearer than many politicians would like. For humanity to have a “likely” chance (at least two-thirds) of staying below the 2°C threshold, a small reduction in CO<sub>2</sub> emissions will not be enough. In fact, emissions will have to fall to zero later this century to stop any further rise in the atmospheric concentration of CO<sub>2</sub>. Simply put, the world economy must be “decarbonized.”

The breakthrough at the G-7 summit was that the seven governments recognized this, declaring that the 2°C limit requires “decarbonization of the global economy over the course of this century.” The G-7 finally stated clearly what scientists have been urging for years: humanity must not merely reduce, but must *end*, CO<sub>2</sub> emissions from fossil fuels this century.

Decarbonization is feasible, though by no means easy. It depends on taking three key steps.

First, we must become more energy efficient, for example, through modern building designs that reduce the needs for heating, cooling, and energy-intensive ventilation. Second, we must produce electricity with wind, solar, nuclear, hydroelectric, geothermal, and other non-carbon energy sources, or by capturing and storing the CO<sub>2</sub> produced by fossil fuels (a process known as CCS). Third, we must switch from fossil fuels to electricity (or hydrogen produced by zero-carbon electricity) or in some cases (such as aviation) to advanced biofuels.

The hard part is the practical, large-scale implementation of broad concepts in a way that does not disrupt our energy-dependent world economy and does not cost a fortune to achieve. But as we tally these costs, we need to keep in mind that runaway climate change would impose the greatest costs of all.

To succeed, we will need several decades to convert power stations, infrastructure, and building stock to low-carbon technologies, and we will need to upgrade the low-carbon technologies themselves, whether PV solar cells, or batteries for energy storage, or CCS for safely storing CO<sub>2</sub>, or nuclear power plants that win the public's confidence. The G-7, notably, committed to “developing

and deploying innovative technologies striving for a transformation of the energy sectors by 2050” and invited “all countries to join us in this endeavor.”

This global process of decarbonization will be long and complex, and it will require detailed roadmaps with periodic redesigns as technologies evolve. Here, too, the G-7 made a historic breakthrough by declaring its readiness to “develop long-term national low-carbon strategies” to get to a decarbonized future. The United Nations Sustainable Development Solutions Network (SDSN), which I direct on behalf of UN Secretary-General Ban Ki-moon, has been working on such low-carbon strategies for the main emitting countries in a project called the [Deep Decarbonization Pathways Project](#).

Of course, the G-7 declaration is only a declaration, and it does not yet include the commitments of many of the world’s largest CO<sub>2</sub>-emitting countries, including China, India, and Russia. Yet it is a crucial step that will greatly encourage other countries to participate in deep decarbonization as well, especially in view of the G-7’s commitment to speed the development of improved low-carbon technologies.

The outcome of the G-7’s meeting augurs well for a strong global agreement on climate change when all 193 UN member states meet in Paris in December to hammer out a truly global climate agreement. The G-7 countries have not yet ensured a successful outcome at the Paris meeting, but they have taken a big step toward that goal.