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No energy security without climate security

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According to Tony Blair, “There will be no genuine security if the planet is ravaged by climate change.” This is something he and other G8 leaders would do well to keep in mind as they sit down in St. Petersburg to consider the topic of energy security.

Climate and energy security are intimately linked. Consequences of climate change are manifest today and include increased frequency and severity of extreme weather events, and political and economic instability. Climate change – in Blair's words again “probably, long-term, the single most important issue we face as a global community” - is driven by emissions of CO₂ mainly from the burning of fossil fuels coal, oil and gas. It is in reducing these emissions that the world has its best chance of avoiding catastrophic climate change and making energy supply secure.

To date, the discussion of energy security has focused on supply, driven by concerns of increasing energy demands, declining oil reserves, unstable and generally rising oil and gas prices, and political instability. Energy security has been diversely and sometimes confusingly defined, but in WWF's view “secure energy” should be based on overriding priorities of:

- Reducing carbon emissions and contributing to curbing climate change
- Keeping intact earth's carrying capacity and avoiding impacts on biodiversity, water flows and other natural systems

- Avoiding relying on long and vulnerable lines of supply
- Being supplied from a variety of different sources
- Being based on equitable arrangements that do contribute to social, political or economic stability and predictability

As the world's leading economies, energy users and generators of greenhouse emissions, the G8 nations have the opportunity – and the responsibility - to refocus this discussion on how best to power the world without putting it at risk.

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This plan would contribute to increased energy and climate security by:

1. Promoting, investing in and regulating for **energy efficiency measures** as the highest priority, as the most cost effective means to reduce reliance on long, insecure links to fossil fuel supplies and limit the damage caused by their extraction and use. Countries need to legislate for mandatory and dynamically improving standards for maximum energy consumption of energy-consuming and energy-conserving



- products and actively phase-out energy-wasting products
2. Continuing to develop and subscribe to the policy and market instruments – such as caps and carbon markets – that promote the **switch to low carbon**, diversified energy sources
 3. Creating better opportunities for all new, renewable and clean energy resources by **redirecting subsidies from conventional to clean fuels** (currently 250 billion US\$/year globally is spent on conventional energy)
 4. Encouraging the uptake of clean and renewable energies by **legislating medium- and long term quantitative targets for renewable energies**.
 5. Recognizing that **nuclear energy is one of the most uneconomic energy technologies** and that it carries a special class of risks centred on safety, waste disposal and weapons proliferation.
 6. Recognizing the value of highly efficient **natural gas as a transition fuel** to a secure, sustainable, zero carbon energy future.
 7. Regarding **carbon capture and storage** as having a potential contribution to make but not as a silver bullet. In this regard, as a matter of urgency, help to create a more global regulatory framework for sound, safe and environmentally-friendly carbon capture and storage and therefore **ensure that only zero-emission coal and gas power plants** are built from now on. In addition, hydrogen introduction from decarbonisation of fossil fuels for non-electricity production must be accelerated.

The G8, climate change and energy security

The last G8 meeting at Gleneagles put climate change firmly on the G8 agenda, with member nations committing to a range of actions and a continuing dialogue. Much more could, and should, have been achieved even if this meant leaving the USA – now the only non-signatory to the Kyoto Protocol within the G8 - behind.

The G8's topic of energy security in St.Petersburg has the potential to either build on the continuing Gleneagles Dialogue or to distract from it. A narrowly focused discussion on the security of energy supply will not deliver a G8 outcome that provides any leadership or impetus on the more critical over-arching issues of providing energy safely and securely in the long-term.

Personal leadership from the presidency has been a key factor in G8 deliberations and pronouncements, and climate change as an issue benefited from UK Prime Minister Tony Blair's initiative. President Putin has identified key elements of energy security as being "stabilization of the global energy markets, development of innovation technologies, use of renewable energy sources, and protection of the environment". Further, he said: "We believe that today we must think very seriously about ways to bridge the gap between energy-sufficient and energy-lacking countries." Russian interests in the issue no doubt are stimulated by its substantial reserves of oil, natural gas and uranium.

While such leadership is encouraging in some respects, President Putin should go further and take the opportunity to minimize the risks posed by climate



change, by addressing climate change within the energy security debate, and highlighting the dramatic improvement of energy efficiency as crucial to enhanced energy security.

WWF contends that the concept of energy security is meaningless unless it is seen in the wider context, where the over-riding threat is climate change caused substantially by fossil fuel use. Forms of energy that are safe for the climate contribute generally to human security in the long term while, in the words of the Earth Policy Institute's Lester Brown, "to subsidize the use of fossil fuels is to subsidize crop-withering heat waves, melting ice, rising seas, and more destructive storms."

Climate security and energy supply

The scientific consensus is that the world faces grave risks of catastrophe if the global rise in average temperature cannot be kept under two degrees Celsius in comparison to pre-industrial times, and if global emissions do not peak and begin declining in 10-15 years. Much of the world has had a taste of what could come with a temperature rise of just over a quarter of that mark (0.7°C): heat waves, more frequent and more severe storms, persistent drought and increasing loss of biodiversity, with rainforests, mountains and coral reefs being particularly vulnerable. In addition, atmospheric CO₂ pollution already acidifies the oceans presently about 100 times as fast compared to any time in the last 100,000 years threatening this very fragile marine web of life. If the 2°C threshold cannot be avoided, immense security implications are inevitable, such as:

- Continuing increase in frequency and severity of extreme weather events

- Crop failures in heavily populated or key food producing areas.
- Unprecedented environmental refugee movements
- Border disputes over resources, particularly water
- Spread of endemic disease
- Political, economic and social consequences of governments and other social structures becoming overwhelmed by direct and indirect climate change effects.

These impacts, and many more documented in scientific literature, would create an inherently unstable world, making the current debate about unstable energy supplies appear trivial. Many of these impacts will hit the most vulnerable around the world, likely creating an entirely new group of "climate refugees" no longer able to survive in their countries due to droughts, famines and other extreme events and changes.

There are in fact other observed trends that could have global implications on rich and poor nations alike. These eventualities of 'abrupt climate change' include mass ice melting of glaciers in Greenland and Western Antarctica, leading to sea level rise much greater than currently anticipated, related disruptions to the great ocean circulation patterns (the thermohaline belt, also known as Gulf Stream), and relatively sudden large scale carbon releases from destabilized ocean and forests or tundra deposits of methane.

To minimize or prevent these possibilities, global emissions need to decline by at least 50% globally by mid century and lead to a world with low carbon energy supply soon thereafter, well above the level of progress specified in the current UNFCCC/Kyoto framework. The largest cuts are



required from G8 economies, in line with a requirement for industrialized countries to reduce all emissions by about 80 percent by 2050. In the face of growing energy demand this is a challenging but not insurmountable task requiring a quantum improvement in energy efficiency and a wholesale switch to low or no emission energy sources. Joint consideration of energy and climate security endorses just this direction.

Comprehensive energy and climate security policy

It is quite clear that one fuel source or policy alone will not be adequate to respond to climate change nor energy security issues. A full, integrated package of policies, measures and strategies will be required in order to ensure a stable future. The G8 should launch a Climate and Energy Security Plan that builds on the following trends and facts.

Overstretched supply lines

The world has had ample illustration that the most vulnerable energy situation is over-reliance on limited, distant energy sources. Climate change will make this situation even more tenuous, by increasing the frequency and severity of extreme weather events and contributing to the political instability that can disrupt energy supplies. A recent, graphic illustration of this was Hurricane Katrina's effect on both supplies and even more spectacularly, on oil prices.

Improvements in energy efficiency and the switch to renewable energy sources reduce this built-in vulnerability of long supply lines. Energy efficiency moves are often local in application and cumulative in effect. Renewables diversify energy systems often from a

multitude of small sites and are often situated close to where energy is used.

Oil: becoming scarcer and more expensive

Current rates of oil use are highly unlikely to be sustainable for much longer, regardless of any moves away from oil to mitigate climate effects.

But climate change alone is a compelling argument to move away from oil as quickly as feasible. The energy security argument also favors this course, only partly on the grounds of the inherent insecurity of supply from a few of the world's less stable regions. Another argument becoming more and more compelling as reserves are drawn down is that the move away from reliance on oil can be planned for and controlled if started early enough - or it can be sudden and catastrophic.

Coal: burdened by emissions

Coal remains the most abundant of fossil fuels and the most used after oil. It is however burdened by high emission levels. Coal burns only half as efficiently as natural gas (it produces up to twice as much CO₂ per energy unit). While efficiency rates can be improved from the pitiful level in older power stations, coal remains the most significant single contributor of the emissions causing climate change. Carbon capture and storage (CCS) may have benefits as a bridge towards a low/zero emissions society but there is a clear need for international standard setting in this area. Furthermore the technology is so far not sufficiently proven and further development could meet with long delays and unforeseen cost. The key questions must be answered in the next two to three years for as long as fossil fuels remain the major part of the energy



supply matrix, CCS needs to be an important part of the equation to reduce emissions. A sustainable energy strategy will acknowledge the role of CCS – both for post- and pre-combustion decarbonisation - for the next decades as a bridging strategy towards an ultimately zero-carbon energy system based on sustainable renewable energy.

However, WWF warns the G8 countries not to embrace CCS technologies as the future silver bullet that minimizes the need to act on structural changes in the energy sector now. WWF urges the G8 to affirm a position that investments in developing CCS should not take precedence over investments in proven demand reduction and energy efficiency strategies or proven renewables technologies. In addition, the open questions around this technology should be answered expeditiously so as to determine its role in the low carbon future.

Natural gas: transition fuel

Natural gas can be less damaging than other fossil fuels because of its higher efficiency for energy production. From a climate change point-of-view, natural gas – especially with CCS or as a base for hydrogen production - has potential as a bridging fuel towards the low/zero emissions society and currently plays a role in the possible establishment of hydrogen as a viable, sustainable fuel. But CO₂ emissions remain a problem. From an energy security viewpoint, areas rich in natural gas are relatively remote from key markets, making it also subject to disruptions from extreme weather events or political and economic instability. Compared to oil, the main resources of natural gas are even more concentrated in fewer countries. Natural gas must therefore be considered as bridging fuel for the next

three to four decades but is not a long-term solution to climate change or to energy security.

Misguided enthusiasm for the nuclear option

G8 energy ministers in March endorsed “wide scale development of safe and secure nuclear energy” for those countries wishing to pursue this path “as crucial for long-term environmentally sustainable diversification of energy supply”; the associated G8 energy security conference was told of “a nuclear renaissance”. The key words here might be “safe and secure”: nuclear energy advocates have not yet been able to answer the safety, waste and proliferation concerns that will become even more prominent in the context of any rapid expansion of plants into more nations. Additionally and perhaps more tellingly, disregarding subsidies and allowing taking into account plant commissioning and decommissioning, the net energy benefits of nuclear power are less cost-effective than other more environmentally benign technologies. WWF therefore rejects the use of nuclear energy as a solution technology.

Energy efficiency: most cost effective by far

Energy efficiency measures (or negawatts as they are sometimes called) are the most cost effective way of adding energy capacity and enhancing energy security, with the considerable added benefits of cost savings, health and environment benefits. For Europe for instance, the potential for cost-effective savings for the next 15 years is generally set at 20-30 % of current demand and the technical potential much higher.



WWF urges the G8 to commit to energy efficiency and demand reduction measures as the highest priority for enhancing energy security and preventing catastrophic climate change, with a range of policy settings that include mandatory demand reduction targets, especially for utilities and government agencies, support for energy efficient products that includes public procurement programs and incentives for their purchase by consumers, continually raising the bar on minimum efficiency standards for buildings, electrical equipment and vehicles and energy labeling as a norm for all energy using products. The great potential of combined heat and power technologies (for instance estimated as having the potential to save up to 46 % of US CO₂ emissions) should be supported by growth targets and improved access to grids.

Renewable energy – going beyond the rhetoric

The potential contribution of renewable energies is underlined by the explosive growth in investment in wind, solar, sustainable biomass, geothermal and other technologies. Many are now competitive energy suppliers, even in the face of massive levels of subsidies to fossil fuels and in many countries a merely rhetorical policy support. With ambitious support and simultaneous expansion of energy conservation, realistic targets are that:

- sustainable biomass could supply 15 -30 % of OECD electricity by 2020
- wind could supply 12 % of global electricity in the next 20 years
- passive solar heating is highly cost effective while solar electricity is growing rapidly

Renewable energies are especially relevant from an energy security viewpoint as they diversify energy sources, promote efficiency and generally reduce reliance on extended energy supply routes and vulnerable infrastructure. While G8 often mention renewables favorably, in practice the priorities for influential support are often long term research and development of less proven and immediately available technologies in hydrogen, methane and carbon capture and storage. G8 could better support renewables with such measures as mandatory renewables targets, improved access to grids which could include supportive “feed-in” prices to help establish technologies, and through reduced subsidies to fossil fuels.

Conclusion

The G8 gives President Putin and other leaders the opportunity to correctly frame the security debate in terms of *both energy and climate security*. *When one assesses the current scientific and energy developments globally, it is very clear that a sophisticated strategy combining energy efficiency, renewables and natural gas as a bridging fuel, can provide the pathway for a low carbon future. In addition, leaders should ensure that the crucial questions surrounding carbon capture and storage are answered expeditiously so as to determine the scale of its role in climate and energy security solutions in the future. Only with this strategy will climate insecurity be curbed.*

OVERVIEW: No energy security without climate security

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Contact:

Jennifer Morgan, Director, WWF Global Climate Change Programme, morgan@wwf.de
Martin Hiller, Communications Manager, WWF Global Climate Change Programme, mhiller@wwfint.org

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