OCHA Occasional Policy Briefing Series – No. 3

Energy Security and Humanitarian Action:

Key Emerging Trends and Challenges

September 2010

OCHA Policy Development and Studies Branch

For more information, please contact:

Policy Development and Studies Branch
UN Office for the Coordination of Humanitarian Affairs (OCHA)
E-mail: ochapolicy@un.org
Tel: +1 917 367 4263

I. INTRODUCTION

1. Humanitarian stakeholders are increasingly concerned about the impacts that current or emerging global challenges, such as climate change, the food crisis, population growth, water scarcity, and energy security, may have on the overall operating environment for humanitarian actions, in particular the convergence of humanitarian needs and caseloads, including in so-called "development contexts." While anticipating the evolution of these challenges – propelled by various political, economic, legal, demographic, environmental, and technological factors – is a complex task at best, it is clear that their individual and combined impacts are already shaping and will continue to shape humanitarian action.[1]

2. One challenge in particular that threatens to shape humanitarian action is that of energy security. A recent report on the implications of energy security for achievement of the Millennium Development Goals (MDGs) cautioned that today's energy situation "entrenches poverty, constrains the delivery of social services, limits opportunities for women, and erodes environmental sustainability at the local, national, and global levels." Indeed, energy is integral to all aspects of human welfare, including security, food production, water, health, education, and shelter. Achievement of all eight MDGs hinges on access to basic energy services, and energy access must be seen as a means to development and not an end in itself.

3. The 2008 oil price surge served as a cautionary preview of the potentially dire consequences that may follow from a full-scale energy crisis. The energy and fuel price increases in the past couple of years succeeded in bringing greater visibility to the interlinked challenges of energy access, reliability of affordable food supplies, climate change, and developmental progress toward the MDGs. In doing so, the plight of nearly half of the global population's lacking access to basic energy resources was also illuminated. Short of a full-scale crisis, today the world nevertheless faces twin interrelated energy threats: that of scarcity, in which inadequate energy supplies at affordable prices exist to meet current and projected demand leaving many without access, and that of dependency on non-sustainable and inefficient energy forms, which is itself both environmentally and financially unsustainable. The impacts of this energy insecurity, beyond a measurement of vulnerability, will not have isolated effects, but will trigger vulnerability to other shocks and exacerbate humanitarian need.

4. In humanitarian terms, this note offers an initial analysis of what energy insecurity portends for the:

- **Impact on vulnerability and the need for humanitarian assistance:** Energy insecurity heightens the vulnerability particularly of the chronically poor, thereby increasing the potential for the sheer number of individuals requiring humanitarian assistance, including in development contexts. It can also be expected that those already receiving assistance or who are acutely vulnerable will

[1] For example, as seen in the Kyrgyzstan and Tajikistan contexts.

be most adversely affected by any increases in energy insecurity and cut off from dwindling fuel sources, thereby increasing the depth of their need.

- **Impact on the conduct of humanitarian operations:** In response to the increase in the need for humanitarian assistance, it may become necessary to scale up operations in new ways to meet these increased demands. Yet, the reach, mobility and timely deployment of today's humanitarian operations are heavily fuel-dependent and operations will become increasingly expensive to fund. Existing and projected demand for increasingly scarce energy resources may force humanitarian actors to reconsider their response mechanisms in order to avoid disruptions in the provision of humanitarian assistance.

II. OVERVIEW OF THE GLOBAL ENERGY SECURITY SITUATION

Projected energy demand and insecurity

5. While non-renewable energy resources will continue to become increasingly scarce, global dependency on them will only continue to grow steadily over the next few decades, thereby compounding their scarcity. The International Energy Agency (IEA) forecasts that energy demand, driven primarily by population and GDP growth, will rise by over 50 percent between now and the year 2030. Over 70 percent of this increase in energy demand will stem from population growth in the developing world, with China accounting for 30 percent alone. Yet, developing countries, where the majority of those without access to energy services currently reside, largely lack the infrastructure or resources to develop and invest in alternative energy sources on their own accord. As such, dwindling reserves of fossil fuels – with their adverse environmental impacts – will account for 83 percent of the projected increase in energy demand.

6. Peak Oil is a scenario that occurs when global oil production reaches a maximum threshold of extraction after which point it enters irreversible decline. If demand remains constant, prices will inevitably rise as demand outpaces supply. If current demand is any indication, for every barrel of oil that is discovered, three are being consumed. There is also growing evidence that some of the primary oil producing nations (e.g., in the Middle East, Russia) are also those with the fastest growing demand. As global supply declines, it is feasible that these countries may cut exports in order to first satisfy domestic demand and avoid internal political unrest. Geopolitically, the risk of a major supply disruption to energy resources, whether due to terrorism, piracy, or political tensions, will undoubtedly increase as demand outstrips supply. This unprecedented demand for limited reserves of fossil fuels may have two broad consequences. First, as oil prices remain highly volatile since 2008 and analysts predict prices will stabilize between US$75 and US$85 – which is still well above historical levels in real terms – this imbalance in supply and demand may induce a price spike making this fuel source extremely costly, and thereby critically inaccessible for many communities in developing countries, including rival small-holder farmers and the urban poor. Second, without the development of alternative energy

sources to meet growing demand, developing and vulnerable populations may find their fuel needs increasingly unmet.

Existing energy poverty

7. Growing energy insecurity will have the greatest impacts in the developing world and among poor communities, where access to energy services is already limited and where fuel price rises will make the difference between chronic poverty and extreme or even acute vulnerability. Nearly one third of the world's population has no access to electricity and nearly half still relies on traditional biomass and cook over rudimentary open fires. In fact, this traditional bio-energy from wood and organic wastes constitutes up to 95 percent of energy supplies in developing countries. However, this energy source has been linked to adverse health and environmental consequences from indoor air pollution[2] to accelerated deforestation, land degradation, and soil erosion. In concrete terms, ending energy poverty for almost half of the world's population means:

- Supplying elemental needs such as cooking and heating;
- Energized pumping to bring water closer to the home;
- Refrigeration for vaccines and food staples;
- Lighting in health clinics to extend hours of operation;
- Basic equipment in schools to improve educational facilities and attract better teachers, especially in rural areas;
- Increased hours of productivity for income-generation or reading;
- Modern stoves to avoid daily exposure to noxious fumes;
- Gender empowerment by lessening women's workload in collecting fuel/water;
- Transportation and communications to increase market access; and,
- Motive power for enhanced agricultural productivity.

In the short- to medium-term and without considerable investment and financing of alternative energies in the developing world, any prospect of ending or alleviating energy poverty means that the developing world's carbon emissions will inevitably increase. To accommodate and sustain this increase to grant energy access to much of the developing world, however, given limited supplies of fossil fuels and global carbon constraints, the developed world's absolute and relative share of fossil fuel consumption will likely drop. A move toward energy efficiency with the widespread adoption of more renewable energy resources in the developed world may also help to accommodate this.

Current and future trends intersecting with energy security

8. ***Development and achievement of the MDGs:*** While energy by itself is not a sufficient guarantee or pre-requisite for development, it is a necessary one to eradicate poverty and spur economic growth. While there is no specific MDG on energy *per se*, none of the MDGs can be met without affordable, accessible, and reliable energy services. For example, energy security advances progress toward MDGs [1] by enabling

[2] Ken Sexton's "*Indoor Air Pollution*: A Public Health Perspective" (2006).

more diversified, productive, and longer hours for income generation, greater access to modern fuels and stoves for cooking, and energy for irrigation to improve agricultural productivity. With regard to MDGs, energy security frees time for education – especially for women [MDG 2 and 3][3] – from time otherwise spent collecting traditional fuel and water supplies. In terms of MDGs 4, 5, and 6, energy powers equipment to pump and treat water, provides heat to boil water, prevents exposure to biomass fumes, and allows for the refrigeration of vaccines. Additionally, given that many developing countries continue to subsidize what provision of energy services do exist – a practice that encourages higher consumption and impedes the development of more environmentally benign energy sources – greater energy security would ostensibly free up some of this government funding for fiscal stability measures or even direct support of development action.

9. ***Climate change, environmental degradation, and water scarcity:*** Energy consumption accounts for approximately 80 percent of global greenhouse gas emissions. As a leading culprit in global warming, energy leads to fossil fuel emissions that pollute the air, but it also contributes to environmental degradation through the acidification of land and water and deforestation for biomass fuels. Fuel demand from biomass has been linked to desertification in the Sahel. Climate change threatens the already strained relationship between energy security and natural ecosystems; those who depend directly on ecosystems for their energy needs, such as through biomass, will suffer the most. However, hydropower is also likely to be heavily impacted given its sensitivity to precipitation and temperature at a time when climate change is resulting in temperature warming and decreased average annual rainfall in many areas. Under climate change models, projections of water scarcity and drought point to the importance of diversifying energy sources, especially given that water is indispensible to all forms of energy production, but particularly for hydropower, the cooling of power plants, fossil fuel production and processing, the hydrogen economy, and biomass production.

10. Fears that energy demand will outstrip supply underpin a burgeoning alternative energy sector to replace or supplement fossil fuel reserves. As witnessed in 2008, the oil price shock generated unprecedented interest in the cultivation of ethanol bio-fuel crops. However, bio-fuel production is the most significant consumer of water in the alternative energy sector. Yet, global bio-fuel demand, and with it agricultural demand for water, is projected to continue to increase as fossil fuels become scarcer and hence more prohibitive in cost. While energy production may divert water from household consumption or agricultural irrigation, these energy production processes also risk contamination of underground and surface water supplies.

11. ***Population growth and demographic shifts:*** Of this increase, the collective population of developing countries is expected to rise from 5.6 billion in 2009 to 7.9 billion in 2050.[4] This rapid increase in global population and acceleration of global

[3] According to Sexton, K (2006), nearly 1.3 million, predominantly women and children, die each year due to exposure to indoor biomass air pollution.
[4] For example, the Yemeni population, at 20 million, has doubled every 17 years.

economic activity clearly translates to increased demand for both renewable and finite energy resources. Over 70 percent of the increase in energy demand comes from developing countries, with China alone accounting for 30 percent of this. However, it is in developing countries and rapidly emerging markets, where most of this population growth will occur, where energy poverty is most entrenched and where resources are lacking to invest in developing and scaling up renewable energy resources. This projected population growth will also place an additional strain on water resources in many developing countries, particularly those where the impacts of climate change will be the greatest, which will constrain options in terms of energy production methods.

12. By 2025, it is expected that the global population will shift from current figures of 55 percent rural and 45 percent urban to 41 percent rural and 59 percent urban. Environmentally-induced migration, especially in agricultural economies where climate change contributes to or aggravates drought, will account for much of this shift. Access to energy is currently one of many issues dividing those in rural areas from their urban counterparts. Four out of five people without access to electricity live in rural areas in the developing world, namely in South Asia and sub-Saharan Africa. Of the minority with energy access, however intermittent, rural residents typically spend a high proportion of their household incomes on energy, yet – given the lack of infrastructure or decentralized energy production in many areas – rarely enjoy less costly or higher quality energy sources.[5] Many in rural areas still rely on traditional biomass fuels like wood, charcoal, and dung for their cooking, heating, and lighting needs. High transaction costs constrain the provision of more efficient energy services in rural settings. Thus, in terms of energy, urbanization could potentially introduce many households to more efficient and modern energy practices. Given the pace at which urbanization is projected to take place, however, it is more likely that it will place electricity infrastructure and modern fuels under serious strain and create gaps in access within cities.

III. HUMANITARIAN IMPLICATIONS OF ENERGY SECURITY

Impact on vulnerability and the need for humanitarian assistance

13. Energy insecurity may heighten both chronic but also acute vulnerability, thereby increasing the incidence and depth of humanitarian assistance needs, whilst also transforming operational environments.

14. ***Energy and instability***: Already, we are noting that limited energy resources have the potential to incite riots, fuel conflicts, amplify geopolitical tensions, and spark civil unrest, as seen in Egypt, Bangladesh, or Haiti. Given insufficient energy supplies to meet demand, previously stable communities may find themselves engaged in conflict over energy resources, and the degree of violence and unrest in conflicted communities may

[5] According to the World Bank, the cost of refined fossil fuel, in excess of $75 per barrel, has direct consequences on the financial efficacy of food production, particularly due to transportation and manufacture costs.

escalate with disputes over energy resources. For example, after Indonesia withdrew subsidies for fuel, which induced a 30 percent fuel price hike, daily protests erupted. In Lebanon, reports were received of 5 killed and 40 injured as a result of civil unrest over rising fuel costs. The food and energy riots in 2008 are further testament to this risk. It is projected that contestations and political maneuvers over energy resources will only increase as they become more scarce and unable to meet dependency on them. Another factor is what has been termed "the resource trap," in which the development of natural resources may precipitate economic and governance problems (e.g., Nigeria, Democratic Republic of the Congo). If not properly managed, the discovery and exploitation of oil reserves in resource-rich developing countries may actually further entrench poverty and ignite conflict.

15. ***Energy and food insecurity:*** Energy insecurity may also drive food insecurity. Without access to a predictable energy supply, communities that are not food insecure may become so, and those who are already food-insecure may become even more vulnerable. There can be no food security for communities without reliable access to a fuel source for heating and cooking. Currently, more than 2.4 billion people, some of whom are already beneficiaries of relief assistance, lack the necessary supplies of fuel to meet their household cooking and heating needs. Many smallholder farmers, especially in rural areas, lack the necessary agricultural implements such as fertilizers or generators to increase the productivity of their labor. These figures could only increase in a context of scarce energy resources. In the 2008 oil price hike, experts from the World Bank calculated that when the price of a barrel of oil rose above a certain threshold (e.g., US$80/barrel), it was no longer profitable for small-holder farmers in the developing world – who grow most of the food in these countries – to farm. Regarding the most fertile land, concerns were raised over the pursuit of alternative fuel sources, like bio fuel, protracting food insecurity and the displacement of pastoralist communities by creating competition with small-scale subsistence farmers, most of whom lack legal land tenure rights. As witnessed in 2008, the oil price shock generated unprecedented interest in the cultivation of ethanol bio-fuel crops. However, this increase in ethanol crops to meet growing fuel demands meant that limited arable land was substituted from food to ethanol crops. It is projected that growth in bio-fuel production to 2030 will require an additional 35 million hectares of land.[6] Bio-fuel production to reduce dependency on fossil fuels by only 10 percent will require 7 percent of the world's arable land. Thus, the question is where and with which (and whose) resources this growth in bio-fuels would take place.

16. ***Energy and health:*** Communities who lack reliable access to energy sources often suffer aggravated emergency health conditions. During the 2008 Central Asia energy crisis in Tajikistan and Kyrgyzstan, energy needs were not sufficiently incorporated into the response, thereby causing donors and agencies to scramble to arrange emergency procurements of fuel and generators. The absence of a fuel source for indoor heating meant that many were exposed to sub-zero temperatures. Increases in reported respiratory infections were noted. At the same time, dependency on generators for the functionality of hospitals limited procedures to only those deemed most critical;

[6] Food and Agriculture Organization (FAO), *The State of Food Insecurity in the World*, 2009.

hence, many infants were prematurely taken off incubators. The referral process for medical treatment created delays that cost lives. Also, many households resorted to burning biomass waste for their cooking and heating needs, which posed serious health risks such as indoor carbon monoxide poisoning, lung disease and asthma, and impaired vision. Nearly 1.3 million, predominantly women and children, die each year due to exposure to indoor biomass air pollution. Energy services allow for health clinics to have longer hours of operation, which can yield tremendous benefits especially for rural areas, for refrigeration of vaccines, for treatment of water supplies to prevent water-borne illnesses, and for mass communication campaigns to conduct prevention education around HIV/AIDS and other transmittable diseases.

17. ***Energy and gender***: Given that it is principally women and children who bear the onus of collecting raw materials for biomass energy and who suffer the personal security consequences of poor lighting, the absence of modern energy supplies or predictable access may fuel gender inequality and the particular vulnerability of women. In rural sub-Saharan Africa, for example, many women carry up to 20 kilograms of fuel-wood an average of 5 kilometres every day. In the Sahel, some women have had to travel up to 20 kilometres to gather household fuel resources. This effort alone consumes a large share of their caloric intake from their daily meal, exposes them to risks of violence while *en route*, and prevents them from engaging in other productive activities, including education.

18. ***Energy and increased vulnerability to natural disasters:*** The absence of a reliable energy source may compel populations to source their energy needs from raw materials leading to environmental degradation, which also increases overall vulnerability to natural disasters. As witnessed in the 2004 South Asian tsunami and the 2008 Haitian hurricane season, the depletion of mangrove forests and the effects of deforestation severely increase vulnerability to natural disasters. The toll exacted by hurricanes in Haiti is now compounded by devastating landslides since the soil is no longer being stabilized by tree roots. Additionally, if the resources typically used for the construction of housing are diverted to meet energy needs, households may be left without permanent shelter for protection from harsh weather and insecurity.

19. ***Energy and elimination of social safety nets:*** While humanitarian need may increase, social safety nets and government funds to assist those in need will likely be diminished or eliminated. Most developing governments heavily subsidize fuel supplies for their populations, and increased fuel costs coupled with fuel dependency may require them to allocate more monies from other services, cut social safety nets, or suffer economic contraction. For example, in Tajikistan, damage to the national economy on account of the 2008 energy crisis is estimated at over US$250 million, which inevitably caused the government to have to reduce its social expenditures and safety nets in other areas. Similarly during the global food crisis in 2008, the Government had to make choices to cut subsidies for food and food production in favor of continued subsidies for fuel, so as to avoid the risk for spontaneous unrest.

Impact on the Conduct of Humanitarian Operations

20. At the same time that energy insecurity may increase the need for humanitarian assistance and thus leading to a call for scaled-up operations, it may also impose new policy, operational, and ethical constraints on the humanitarian system. Currently, the humanitarian system relies heavily on fossil fuels for the delivery of emergency relief and personnel, diesel-generated electricity to facilitate many aspects of relief coordination, and refrigeration, oil-based plastics, and medicines that may be prone to rising energy costs. Therefore, it may behoove the system itself to take active steps where possible and practical to reduce fossil-fuel energy consumption through green technologies such as solar and wind energy, the use of recyclable materials, and local purchasing. That said, practical and short-term action will always be required. For example, there are many examples from the 2008 food and fuel crises where governments were forced to make choices to cut subsidies for food and food production in favor of continued subsidies for fuel, so as to avoid the risk of spontaneous unrest.

21. On the policy side, in order to be fully equipped for growing energy insecurity, the humanitarian community will need to continue to incorporate an emphasis on preparedness, which would contribute to preparing for increased needs and buffering its operations from sudden price shocks in order to avoid an interruption in the delivery of emergency services. This may require developing contingency plans that look at energy shocks, to identify proactive strategies to mitigate the serious impacts as well as to engage in knowledge transfer and planning with national and regional partners to mobilize resources in advance. It may also involve conducting risk analysis, in part through the identification of tipping points, to identify and monitor the communities who may be most vulnerable to energy price rises in the areas of cooking, heating, electricity, and lighting.

22. The increased need for humanitarian assistance due to energy insecurity will also introduce humanitarians to new demographics of beneficiary target populations. Some of the most vulnerable groups in the 2008 Central Asia energy crisis were demographics with which OCHA had little expertise profiling or responding to, such as urban residents, the elderly, or prisoners.

23. Operationally, technological innovations in air transport have enabled the humanitarian community to mobilize its assets to ensure that humanitarian personnel and equipment are deployed immediately after a crisis and are not constrained by the distance, terrain or remoteness of a locale. However, this results in very costly, fuel-intensive operations. With growing energy insecurity, it may become increasingly expensive, and arguably unsustainable, to man energy-intensive operations in areas where there is little to no access to fuel.[7] Yet, those are also some of the most vulnerable areas because of their limited fuel security. As fuel prices soar, the transport and provision of humanitarian assistance may become prohibitively costly and it may become increasingly untenable to reach all beneficiary communities. Therefore, it may be necessary either to

[7] For example, WFP's transportation costs increased by one third during the spike in oil prices in 2008.

rely more heavily upon national and regional counterparts for the actual delivery of aid or to be more selective in what constitutes an acute emergency necessitating response. In addition, agencies may have to implement themselves low-energy strategies to make relief and development programs more resilient under carbon constraints.

24. While energy shortages may likely disrupt the vital services of hospitals and other emergency infrastructure dependent upon electricity as throughout much of the Middle East and in Central Asia, thereby requiring humanitarian organizations to have generators readily on hand to replace the services that are cut off, dependency on fuel-intensive generators is not a sustainable or affordable long-term option and investment in diversified and renewable energy technologies will make these vital services more resilient. Energy insecurity, stemming from price, access, or supply volatility, will likely increase food insecurity through rising prices for oil and gas-based agricultural inputs (e.g., fertilizer, pesticides, and transport fuel), but it will also constrain the availability of food aid insofar as its physical delivery – and even the stock of food supplies if supplanted by ethanol crops.

26. Ethically, humanitarian interventions that utilize fuel-intensive methods of aid delivery or source their cooking, heating, and shelter energy needs from the local environment induce environmental degradation. Additionally, the use, particularly if excessive, of scarce energy resources by humanitarian agencies may not only adversely impact relationships with energy-insecure beneficiaries, but also conflict with humanitarian commitments to do no harm. Rather than solely focusing on the ominous prospects of energy insecurity, the humanitarian community also needs to forge partnerships with the private sector, for example, where possible to promote and increase access to alternative and renewable fuel sources such as solar coolers and fuel-efficient stoves. In fact, post-disaster and reconstruction settings offer opportune settings for the promotion of sustainable food, energy, and building strategies (e.g., through application of "passive design" principles in the construction of buildigs, the restoration of basic infrastructure such as sewage systems as energy sources, biogas digesters, and training of beneficiary communities in local food production and composting).

IV. POTENTIAL USES OF THIS OCCASIONAL BRIEF

27. This paper aims to provide a starting point to prompt initial discussion and advance joint analysis within OCHA and among other key actors to understand better and project more accurately the implications of energy volatility and insecurity for international humanitarian action. As more knowledge, analysis, field inputs, and data become available, the brief will be updated accordingly.

28. Given these potential impacts and that that "energy" does not clearly fall within the remit of any one sector, cluster or organization, OCHA and the humanitarian community may want to consider the following actions:

- Conduct a lessons learned study, in partnership with OCHA Regional and Field Offices and UN Country Teams, of how procurement of energy needs took place in the Central Asia and other more "socio-economic" crises to understand better how to integrate and accommodate energy needs in emergency response.

- Consider convening an inter-agency dialogue with other IASC members and/or cluster leads, who may be looking at the implications of energy insecurity for the fulfillment of their respective mandates, to consider preemptively where responsibility for energy needs lie within the humanitarian coordination and, specifically, the cluster system. Also, engage humanitarian partners in a frank discussion on ways to mitigate the humanitarian community's energy footprint.

- Support the organization of a Working Group on the humanitarian impact of energy security to undertake contingency planning for the impact of a Peak Oil scenario on humanitarian response capacity.

- Engage donors and inter-agency partners in integrating concerns for local energy security into future humanitarian flash and CAP processes.

- Undertake advocacy efforts, in consultation with relevant stakeholders, on the humanitarian and development implications of energy insecurity. Capitalize on the 2010 World Summit on the MDGs as a key platform to highlight the inter-linkages between energy access, development, and building resiliency.

- Designate a humanitarian observer to liaise with the UN-Energy consortium and to represent humanitarian concerns within the system-wide effort on energy.

- Ensure that energy concerns are represented in the climate change mitigation and adaptation discussions to support the development of renewable energy resources in the most vulnerable countries.

- Prioritize diversified and renewable energy supply choices for humanitarian operations and, through partnerships with the private sector, capitalize on harnessing new technological innovations toward energy efficiency, e.g., fuel-efficient stoves, production of solar panels and wind turbines, green manure and composting for food production, and designs for community-level energy storage mechanisms.

- Identify and communicate tipping points to establish clarity on indicators of acute vulnerability, assessment methodologies, and thresholds.

- Strengthen linkages with early warning systems, including national and regional monitoring capacities, to capture existing and emerging scenarios of energy insecurity.

- Review current strengths and capacities to adapt and evolve to these implications of energy insecurity. Identify where flexibility is hindered either practically in terms of gaps in expertise and resources, or structurally in terms of mandates and existing humanitarian operational parameters.

- Invest in mandatory indicators analysis and knowledge of larger global trends and developments on energy, in particular fossil fuels to factor into the analysis on potential needs / acute vulnerability for possible energy price shocks or energy shortages.

KEY FACTS ON GLOBAL ENERGY SECURITY

- Demand in energy is expected to increase by 50 percent by 2030. Over 70 percent of this increase in energy demand will stem from the developing world, including 30 percent from China alone. **(NIC)**

- Fossil fuels will still comprise the bulk of the demand (nearly 83 percent for the combination of oil, coal, and gas). **(IEA)**

- Currently, 2.4 billion people lack the necessary fuel supplies to meet their basic, daily household cooking and heating needs, and 1.6 billion – about a quarter of the human race – do not have access to electricity. **(UN-Energy)**

- The projected cumulative investment required between 2005 and 2030 to meet current energy needs is almost US$20.1 trillion. However, even if this investment is secured over the next thirty years, 1.4 billion people will still lack access to electricity in 2030 and 2.7 will still rely on traditional biomass for cooking and heating. **(UN-Energy)**

- Bio-fuel production is set to expand by nearly 90 percent over the next 10 years, reaching 192 billion litres by 2018. Bio-fuel production to reduce dependency on fossil fuels by only 10 percent will require 7 percent of the world's arable land. **(FAO)**

- Raw materials from forests represent over 90 percent of energy sources in Africa. **(FAO)**

- Each US$10 per barrel increase is estimated to cost sub-Saharan Africa 3 percent of its GDP. **(IEA)**

- Today, 2.6 billion people use fuel-wood, charcoal, agricultural waste, and animal dung to meet most of their daily energy needs for cooking and heating, including up to 90 percent of total household needs in many developing countries. Shockingly, about 1.3 million people – mostly women and children – die prematurely every year because of exposure to indoor pollution from biomass. **(UN-Energy)**

- Once oil prices pass a threshold between US$60 and US$70 a barrel of oil ethanol distilled from grains becomes commercially profitable so that the demand for bio-fuels actually increases. **(ODI)**