

Research Article

The Tasks of Cop23

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Abstract

The coming COP23 reunion of the UNFCCC in Bonn this fall is decisive for the possibility of halting global warming. It must make certain that no more defections occur in the Common Pool Regime (CPR) that is the COP21 Treaty as well as face up to the enormous management tasks in implementing the three Goals I, II, III. At the same time it must confront the growing methane threat. This implies taking the Greenhouse gases (GHG) from all sectors of human activities into account.

Keywords: Decarbonisation; COP21; Treaty Goals I; II; III; CO₂s; GHGs; Solar power parks; Collective action; Management tasks.

Introduction

We are coming closer to the major event this fall, namely the UNFCCC reunion of some 190 governments and a thousand journalists for the COP23 conference on climate change. Sponsored by islands state Fiji, the Bonn meeting in late November will send signals about the anti-global warming fight. The COP21 set the objectives – Goal I, II and III – but the COP23 has to decide over the means to these ends: strategy, technology, funding of decarbonisation in the 31st century. If COP23 fails, then Hawking's warning about irrevocable climate changes will become more likely.

Energy is the basics. It generates not only survival but also affluence and wealth, being vital to both poor and rich countries. If energy consumption is reduced, there will be global economic recessions and mass poverty as well as unemployment. But Planet Earth consumes too much energy from one major source: burning fossil fuels. All forms of energy be measured, and these measures are translatable into each other - a major scientific achievement. One may employ some standard sources on energy consumption and what is immediately obvious is the immensely huge numbers involved - see Table 1.

Table 1 holds the answer to why CO₂ and GHG emissions have become the global headache number 1. Energy for humans and their social systems come to an average of 90% from burning fossil fuels: stone and wood coal, oil and gas. And people do that all over

Table 1: Energy consumption 2015 (Million Tons of oil equivalent).

	Total %	
Fossil fuels	11306,4	86,0
Oil	4331,3	32,9
Natural Gas	3135,2	23,8
Coal	3839,9	29,2
Renewables	1257,8	9,6
Hydroelectric	892,9	6,8
Others	364,9	2,8
Nuclear power	583,1	4,4
Total	13147,3	100,0

Source: BP Statistical Review of World Energy 2016.

the world, though to very different degrees from 100% to less than 50% of all energy consumption, because it is necessary for affluence and survival. The enormous expansion in the energy consumption of fossil fuels has allowed the world to take on many new inhabitants, as well as reducing poverty in the Third World and much enhancing affluence and wealth in the First world.

Energy from fossil fuels is conducive to global warming, and thus the COP21 has decided about decarbonisation. But how? Goal II speaks about a 20-40 per cent reduction until 2030, to be replaced by renewable energy and some atomic power. This amounts to an enormous transformation, where each country is responsible for its reductions of fossil fuels, depending upon their specific country predicament as to energy consumption pattern [1]. Some countries rely heavily upon coal or oil and gas, others have considerable hydro power, while poor countries employ wood coal, leading to deforestation and desertification.

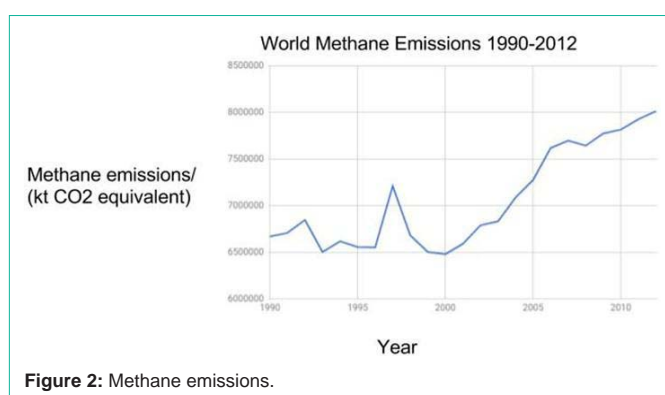
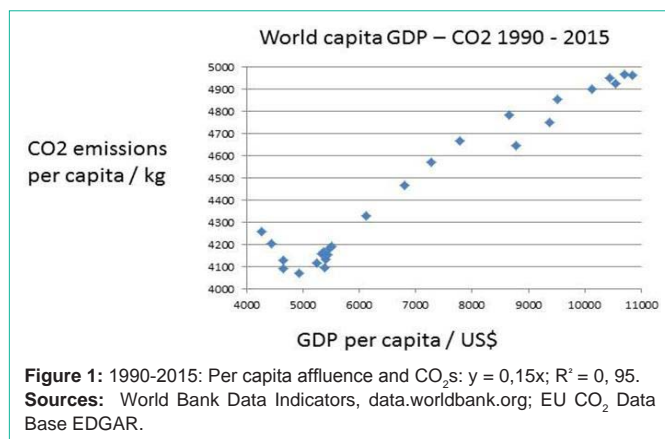
The problems of COP23 are threefold, namely:

- i) International management of decarbonisation processes;
- ii) Avoiding defection or stopping free riding countries;
- iii) Taking into account the new methane threat.

CO₂ and GHG Emissions

One may first with emphasize that things are changing rapidly since the Paris Treaty from 2015, the COP21 Agreement. There is one major defector, the US, which raises the question of new defections. On the one hand, many countries report declining carbon dioxide emissions (CO₂), as gas replaces coal, modern renewables are constructed, and atomic energy becomes relevant again. On the other hand, fossil fuel consumption is increasing in air- and sea-transportation, new airports are built with massive cement like in new infrastructure and Gulf area. The number of vehicles is augmenting, just as their engine size. To check both decreases and increases in CO₂s, one should concentrate more upon total Greenhouse gases (GHG), because they also include the now rapidly augmenting methane emissions, from land and sea.

If energy consumption is the key to understanding CO₂ emissions [2], then what drives the enormous demand for energy globally?



Reply, the human drive for affluence, need satisfaction and wealth. Figure 1 shows the two trends going together: GDP per capita growth (affluence per person) and CO₂ emissions per capita from 1990 to 2015 – longitudinal analysis.

To check both decreases and increases in CO₂s, one should concentrate more upon total Greenhouse gases (GHG), because they also include the now rapidly augmenting methane emissions, from land and sea. Besides methane, the GHGs also cover the small noxious F-particles. Figure 2 shows the increase in methane emissions for available data. Probably, the increase is now even higher (Figure 2). To fully understand the global warming process from anthropogenic causes, one must now add the methane emissions to the CO₂s.

A scientific theory like Global Warming Theory (GWT) consists of a set of hypothesis held together by a model. A successful theory is:

- Coherent logically;
- Confirmed by multiple evidence for its hypothesis and their implications;
- Consistent with other established theories and their evidential base.

GWT has come under heavy scrutiny by means of these three criteria. The debate can be accessed by reading two instructive websites, Sceptical Science for and Science CO₂ against GWT. As Popper's (1962-Conjectures and Refutations) underlined in his theory of the growth of knowledge, theories confront each other, because the phenomena observable can always be accounted for by alternative

theories or models. GWT is a set of conjectures about what happens when Greenhouse gases (GHG) trap incoming sunlight, as its core models how the heating is driven up. GHG has theoretical and practical components.

The global warming problematic houses a number of complex issues that have to be sorted out. Interestingly, they have a bearing upon basic research problems in both the natural and social sciences. Let me make a short overview of global warming theory.

The most recent addition to GWT is Stephen Hawking's ominous prediction about irreversibility. GWT has been known for some 200 years, but never harboring such dramatic hypotheses. French mathematician Joseph Fourier discovered global warming in the early 19th century looking at its contribution to warming a too cool planet Earth. But the negative theory was developed by Swedish chemist Arrhenius around 1895, focusing on the risk of overheating the planet Earth. He calculated that a doubling of CO₂ ppm would be conducive to a 5 degree increase in global average temperature, which is not too far off the worst case scenario for the 21st century, according to UN expertise now. Not until Stephen Schneider published Global Warming in 1989 did the theory receive wide attention with his journal *Climate Change*, no doubt strengthened by the work of Keeling in measuring CO₂ ppm globally. Moreover, techniques for viewing the CO₂ layer were developed, increasing the attention to climate change. Now, the UN reacted with creating a few bodies to look into the changes going on, one of which was the COP framework. The economists entered the GWP, worried about the future costs of this transformation of the atmosphere. On the one hand, Kaya and associates presented in 1997 a model that explained CO₂s with energy and energy intensity of GDP. On the other hand, Stern called global warming the largest externality in human history, calling for international governance in order to stem the growth of greenhouse gases. Stern outlined in 2007 a number of activities aimed at reducing CO₂ emissions, promising also a Super Fund to channel money from rich advanced nations to poor countries and developing economies. As little has been done through the UN system of meetings and agencies – transaction costs - up to date, Stern 2015 asked: "What are we waiting for?", neglecting his promise of the Super Fund [3], to assist poor and developing economies with energy transition.

Some social scientists have argued forcefully that GWT in particular and environmentalism in general is mere politics. Unfounded, GWT and environmentalism is in reality an attack upon the system prevailing, i.e. the capitalist market economy with all its injustices and exploitation. Aaron Wildavsky [4] saw GWT as "Mother of all environment scares". Julian Simon [5] rejected the thesis that natural resources were becoming scarce in a general ecology crisis. And Bjorn Lomborg [6,7] carried the message further asserting the global environment faced few problems and that we should also "COOL It". I believe that this counter attack upon GWT is refuted. One may say that GWT comprises a number of hypotheses with one theoretical core model in the natural sciences, and that it thus is well integrated in a web of beliefs, Evidence: a) Melting of polar ice massively; b) Retraction of glaciers globally; c) Huge land losses along the coasts (Bangladesh); d) Too high temperatures for men and women to work outside (South Asia); e) Food production decline (Africa); f) Fish harvest decrease (Atlantic ocean, Pacific Ocean);

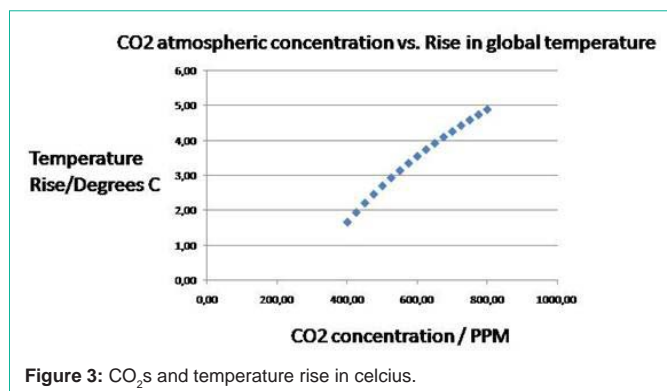


Figure 3: CO₂s and temperature rise in celcius.

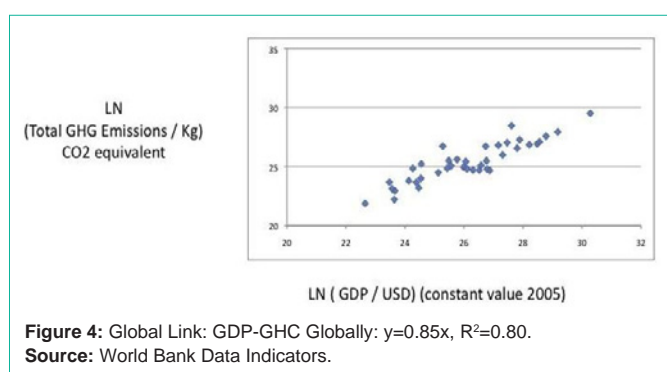


Figure 4: Global Link: GDP-GHC Globally: $y=0.85x$, $R^2=0.80$.
Source: World Bank Data Indicators.

Table 2: GHC minus CO₂s.

Year	GHG other than CO ₂ / Tto
1990	15,56
1995	15,20
2000	14,74
2005	17,20
2010	17,05
2011	18,47
2012	18,97

Source: EDGARv4.2FT2012, European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2.

g) Droughts and starvation (South Asia); h) Lack of fresh water supply (Latin America); i) Drying up of rivers, affecting electricity supply (Latin America, South Asia, East Asia); j) Ocean acidification and species extinction (Australia); k) Highly volatile climate with giant forest fires, storms, rainfall and tornados with tremendous damages (America, Sri Lanka, China, Australia); l) Deforestation and desertification (Africa, Indonesia, South Asia).

Temperature Rise

One may attempt to calculate exactly how increases in greenhouse gases impact upon temperature augmentations. Take the case of CO₂s, where a most complicated mathematical formula is employed:

(1) $T = T_c + T_n$, where T is temperature, T_c is the cumulative net contribution to temperature from CO₂ and T_n the normal temperature

But when it comes to methane, it is not known whether the

tundra will melt and release enormous amounts. But methane does not stay in the atmosphere long, like CO₂s. For the other greenhouse gases, there is no similar calculation as for the CO₂s: If humans could eat less meat from cows, it would mean a great improvement, as more than a billion cows emit methane. Food from chicken should replace beef meat and burgers. The general formula reads:

(2) $dT = \lambda \cdot dF$, where ‘dT’ is the change in the Earth’s average surface temperature, ‘λ’ is the climate sensitivity, usually with degrees Celsius per Watts per square meter ($^{\circ}C/[W/m^2]$), and ‘dF’ is the radiative forcing.

To get the calculations going, we start from lambda between 0.54 and 1.2, but let’s take the average = 0.87. Thus, we have the formula [8]:

Formula: $0.87 \times 5.35 \times \ln(C/280)$.

Figure 3 shows how CO₂ emissions may raise temperature to 4-5 degrees, which would be Hawking’s worst case scenario.

No one knows where the critical temperature rise occurs, i.e. from which Celsius degree global warming becomes “irreversible”, to use Stephen Hawking’s expression. It could be as low as +2 Celsius or as high as +5 Celsius.

To calculate the temperature implications of GHG:s now, one must move beyond the so-called Keeling curve. Table 1 shows the conventional CO₂-temperature curve, but it needs to be complemented by the temperature rising calculation for methane emissions.

The Keeling curve only takes CO₂ into account, indicating now a temperature rise of 1,5 degrees Celcius. However, this must be revised upwards due to the methane threat.

Methane

The global situation with regard to the greenhouse gases appears from Figure 4, where the economic expansion, measured by the GDP, is accompanied by an inexorable growth in GHGs. This trend must be halted and reversed, as otherwise the 21st century will be the greenhouse century of mankind, as Stephen Schneider warned already 1989.

There are several greenhouse gases, but the two biggest are the CO₂s and methane. The UNFCCC has concentrated upon halting and reducing carbon dioxide, but now we are about to face a methane threat. Table 2 shows that methane is growing faster than CO₂.

Decarbonisation

Consider now Table 3, using the giant solar power station in Morocco as the benchmark – How many would be needed to replace the energy cut in fossil fuels and maintain the same energy amount, for a few selected countries with big CO₂ emissions?

If countries rely to some extent upon wind or geo-thermal power or atomic power, the number in Table 3 will be reduced. The key question is: Can so much solar power be constructed in some 10 years? Thus, the COP23 should decide to embark upon an energy transformation of this colossal size.

Solar power investments will have to take many things into account: energy mix, climate, access to land, energy storage facilities,

Table 3: Number of Ouarzazate plants necessary in 2030 for COP21's Goal II: Global scene (Note: Average of 250 - 300 days of sunshine used for all entries except Australia, Indonesia, and Mexico, where 300 - 350 was used).

Nation	CO ₂ reduction pledge/% of 2005 emissions	Number of gigantic solar plants needed (Ouarzazate)	Gigantic plants needed for 40% reduction
United States	26-28 ⁱ	2100	3200
China	none ⁱⁱ	0	3300
EU28	41-42	2300	2300
India	none ⁱⁱ	0	600
Japan	26	460	700
Brazil	43	180	170
Indonesia	29	120	170
Canada	30	230	300
Mexico	25	120	200
Australia	26-28	130	190
Russia	none	0	940
World	N/A	N/A	16000

Table 4: Number of Ouarzazate plants necessary in 2030 for COP21's Goal II: American scene (Note: Average of 250 - 300 days of sunshine per year was used for Canada, 300 - 350 for the others).

Nation	CO ₂ reduction pledge/% of 2005 emissions	Number of gigantic solar plants needed (Ouarzazate)	Gigantic plants needed for 40% reduction
Canada	30	230	300
Mexico	25	120	200
Argentina	none ⁱⁱ	0	80
Peru	none ⁱⁱ	0	15
Uruguay	none ⁱⁱ	0	3
Chile	35	25	30

Table 5: Number of Ouarzazate plants necessary in 2030 for COP21's Goal II: African scene (Note: Average of 300 - 350 days of sunshine per year was used).

Nation	CO ₂ reduction pledge/% of 2005 emissions	Number of gigantic solar plants needed (Ouarzazate)	Gigantic plants needed for 40% reduction
Algeria	7-22	8	50
Egypt	none ⁱⁱ	0	80
Senegal	5-21	0,3	3
Ivory Coast	28-36 ^{iv}	2	3
Ghana	15 - 45 ^{iv}	1	3
Angola	35 - 50 ^{iv}	6	7
Kenya	30 ^{iv}	3	4
Botswana	17 ^{iv}	1	2
Zambia	25-47 ^{iv}	0,7	1
South Africa	none ⁱⁱ	0	190

etc. They are preferable to nuclear power, which pushes the pollution problem into the distant future with other kinds of dangers. Wind power is accused to being detrimental to bird life, like in Israel's Golan Heights. Geo-thermal power comes from volcanic power and sites. Let us look at the American scene in Table 4.

It has been researched has much a climate of Canadian type impacts upon solar power efficiency. In any case, Canada will need backs ups for its many solar power parks, like gas power stations. Mexico has a very favourable situation for solar power, but will need financing from the Super Fund, promised in COP21 Treaty. In Latin America, solar power is the future, especially as water shortages may be expected. Chile can manage their quota, but Argentine needs the

Super Fund for sure. Table 5 has the data for the African scene with a few key countries, poor or medium income.

Since Africa is poor, it does not use much energy like fossil fuels, except Maghreb as well as Egypt plus much polluting South Africa, which countries must make the energy transition as quickly as possible. The rest of Africa uses either wood coal, leading to deforestation, or water power. They can increase solar power without problems when helped financially.

Table 6 shows the number of huge solar parks necessary for a few Asian countries. The numbers are staggering, but can be fulfilled, if turned into the number One priority. Some of the poor nations need

Table 6: Number of Ouarzazate plants necessary in 2030 for COP21's Goal II. Asian scene (Note: Average of 250 - 300 days of sunshine was used for Kazakhstan, 300 - 350 days of sunshine per year for the others).

Nation	Co ₂ reduction pledge/% of 2005 emissions	Number of gigantic solar plants needed (Ouarzazate)	Gigantic plants needed for 40% reduction
Saudi Arabia	none ⁱⁱ	0	150
Iran	4 – 12 ^{iv}	22	220
Kazakhstan	none ⁱⁱ	0	100
Turkey	21	60	120
Thailand	20 - 25 ^{iv}	50	110
Malaysia	none ⁱⁱ	0	80
Pakistan	none ⁱⁱ	0	60
Bangladesh	3,45	2	18

Table 7: Number of Ouarzazate plants necessary in 2030 for COP21's Goal II: European scene (Note: Average of 250 - 300 days of sunshine per year was used).

Nation	Co ₂ reduction pledge/% of 2005 emissions	Number of gigantic solar plants needed (Ouarzazate)	Gigantic plants needed for 40% reduction
Germany	49	550	450
France	37 ^v	210	220
Italy	35 ^v	230	270
Sweden	42 ^v	30	30

Note: The United States has pulled out of the deal

- 1) No absolute target
- 2) Pledge is above current level, no reduction
- 3) Upper limit dependent on receiving financial support
- 4) EU joint pledge of 40 % compared to 1990

external financing and technical assistance.

Finally, we come to the European scene (Table 7), where also great investments are needed, especially as nuclear power is reduced significantly and electrical cars will replace petrol ones, to a large extent.

Grand Scale Policy Implementation: Management Tasks

Although each country is responsible for the execution of its special plan of decarbonisation, international governance faces several challenges in this process towards complete decarbonisation by 2075, globally speaking. It must make sure that:

- a) There is no renegeing;
- b) Funding is available for countries that need assistance;
- c) Best available technologies are spread to all government;
- d) Oversight and control is made yearly;
- e) Defection

For all forms of international governance applies the famous Hobbes' dictum, anticipating by several hundred years the arrival of the theory of the PD game in the social sciences:

And covenants, without the sword, are but words and of no strength to secure a man at all. Therefore, notwithstanding the laws of nature (which every one hath then kept, when he has the will to keep them, when he can do it safely), if there be no power erected, or not great enough for our security, every man will and may lawfully rely on his own strength and art for caution against all other men. T. Hobbes, Leviathan (1651), Chapter XVII.

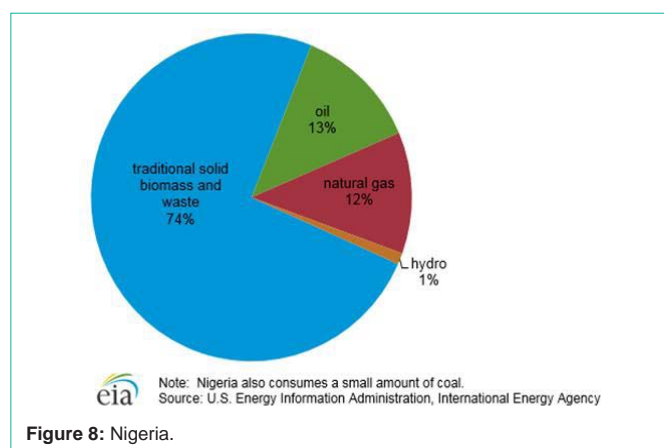
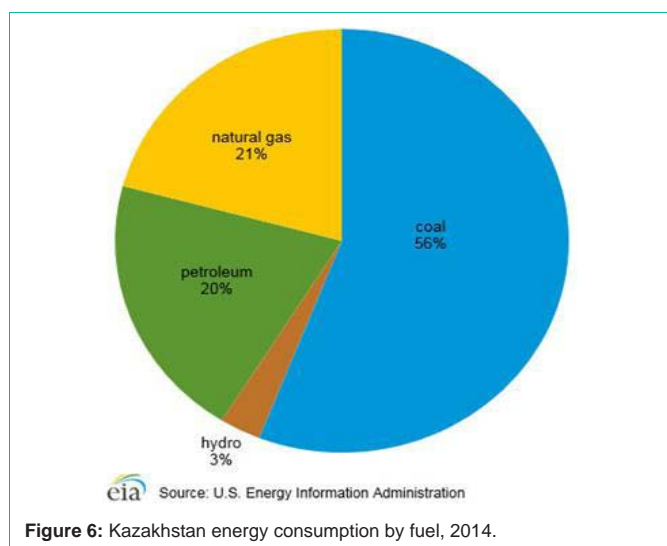
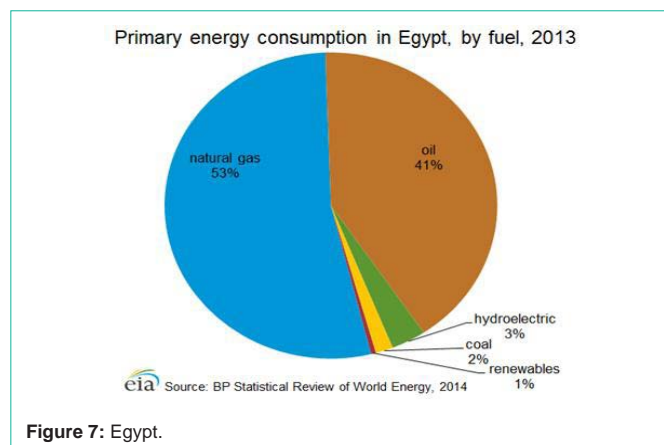
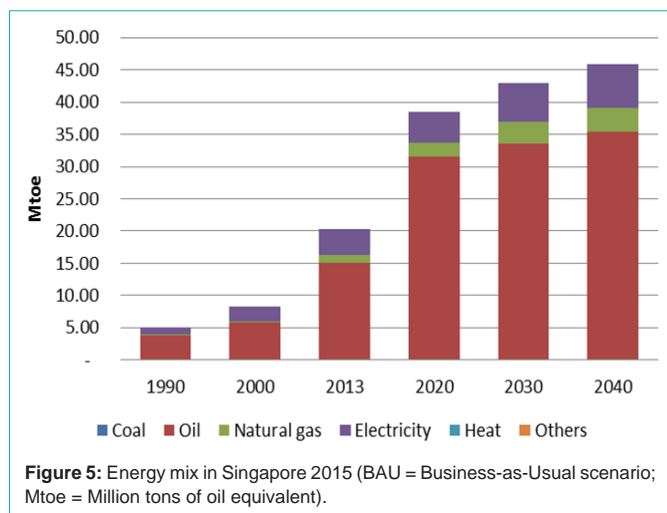
As long as withdrawal from a Treaty does not itself violate basic principles of Public International Law, there is no constraining mechanism available. Thus, the US can now act as a double free rider: no imposed decarbonisation from outside, as well as no obligation to pay into the planned Super Fund. The COP21 Agreement offers a multitude of possibilities to cheat, i.e. renege, especially as it is a huge and long term project with economic implications for both poor and rich countries.

Decarbonisation is nothing but an Ocean PD game, where the players are the signatories to a Common Pool Regime (CPR) [9], instructed to handle the greatest externality in economic history [10]. COP21 is large scale collective action, which is always vulnerable for free riding. Defection can occur immediately, as with the US, or at any stage on the long road to full decarbonisation. Since defection is the sub game perfect Nash equilibrium in a finitely repeated PD game, selective incentives must be employed to hold the CPR together – the Super Fund, already anticipated by [10]. Defection may take several forms besides exit:

- a) Refusal to decarbonize
- b) Delays with elimination of coal
- c) Closing down atomic power for gas
- d) Continued use of wood coal
- e) Refusal to contribute to the Super Fund.
- f) Misinformation about accomplishments of decarbonisation.

Super Fund

The promise of 100 billion \$ per year from 2020 was indeed a spectacular set of selective incentives for poor countries and emerging



economies to stay in this global coalition that involves both costs of closing down facilities and costs of investing in renewables. Although there is some forms of support already in place for decarbonisation, the Super Fund is something of an entirely different order. How to fund? How to manage? Oversight and control! Links with the global funds and donors?

Best Technology Transfer

The technological development is quick in the energy sector with new products forthcoming all the time and prices keep falling almost invariably. For instance, solar power panels are now available in large quantities at much lower costs. Developments in nuclear energy have made these reactors much safer and cheaper. Finally, also wind- and geo-thermal power has reduced pricing. But technological advances must be communicated where they are needed, which is why the UNFCCC must develop consulting competences. The UNFCCC may be asked to give advice to a government about its country strategies. For example, Brazil should be told that its plan for 30-35 dams in the Amazon is not wise, because the future water shortage in the Andes. The best strategy for Brazil is the solar power plants, type Quarazate. For South Asia also, lots of solar power must be better

than giant hydro power projects. Geo-thermal power installations are highly suitable for countries with volcanoes. The proposal by the Asian Development Bank to engage in massive CO₂ capture or sequestration should be rejected entirely by the UNFCCC secretariat.

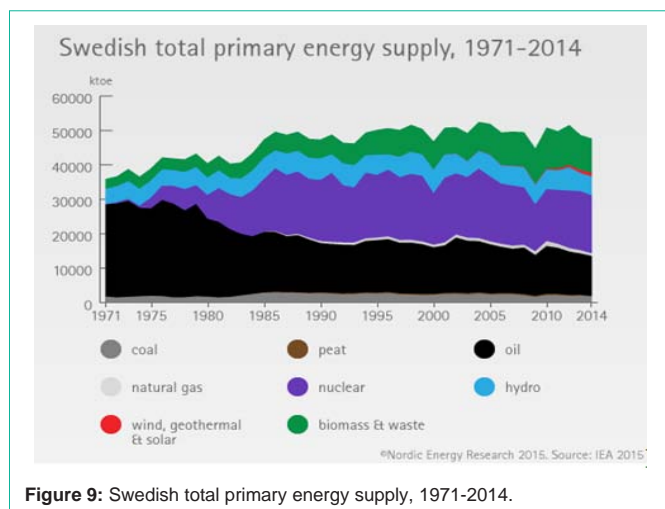
Moreover, improvement in batteries will play a major role for the transition an economy based upon renewable power sources and electrical vehicles.

Oversight

Governments understate problems and setbacks, while exaggerating achievements and successes. To arrive at real decarbonisation, the emissions from the members of the CPR must be continuously monitored. Thus, China states that it is closing down coal plants, but speaks little about the planning for enormous infrastructure investments and the increases in vehicles, engine sizes and air traffic. Likewise, Singapore Figure 5 praises itself for already being a Green city with lots of renewables. But cold figures about energy consumption tell a different story.

Singapore has to invest much more in renewables to comply with Goal II in the COP21 Treaty. Does it possess land enough for large solar power parks? Japan is in dire straits, because its nuclear program has been cut back. What to use except imports of gas and oil?

The temptation to renege a little bit by misinformation must be considerable for countries that are totally dependent upon fossil fuels. See Figure 6 for Kazakhstan (oil, coal and gas), Figure 7 for Egypt (gas



and oil) and Figure 8 for Nigeria (traditional renewables).

Will Kazakhstan with its Soviet legacy of lying with facts report correctly on the huge energy transformation necessary? Consider Egypt experimenting with wind power but lacking the resources to reduce its gas and oil dependency?

Egypt imports more and more oil, but it has to move into the solar energy option radically. Look now at oil giant Nigeria, which has an entirely different energy situation. Being very poor, Nigeria relies upon wood coal. Can it change to solar power by itself? Probably not.

Some countries have a much more favourable energy situation – like Uruguay. Look at Sweden for instance, however creating a problem - Figure 9. When the country closes its nuclear power stations, it will face difficulties to decarbonise, although it boasts 100 per cent decarbonisation in the near future.

Actually, also France and Germany will attempt to reduce or eliminate atomic power, while also cutting fossil fuels according to Goal II by the COP21 Agreements. Perhaps impossible?!

Collective Action, Management and Cop23

Reneging is not the only major obstacle to the COP21 project. Can one expect India to stay in this CPR when its coal dependency is seriously questioned [3]? And how about South Korea and Australia that are so eager to prioritize economic growth? When any country runs into energy supply problems, then its government will of course renege somehow. Only selective incentives can make the difference, but they call for strict and transparent management from international governance and funding agencies.

The risk of COP management – internationally, nationally and local - is the massive occurrence of so-called garbage can decision-making. It constitutes fundamental chaos in outcomes, containing policy failures all over the place. It is not only collective action cheating, but covers also ambiguous goals, uncertain means as well as cost inefficiencies.

The Politics of Climate Change

It is sad to establish that climate change remains not really

politically relevant in domestic politics, although more and more feared by the ordinary citizen. Myopia has always been the mark of politics and what could happen in 10 or 20 years is not of immediate concern. The dire warning of Stephen Hawking – global warming turning irrevocable - is rejected vehemently by the climate change opponents, without explaining why or accounting for ongoing climate change damages.

Politicians speak of energy transformation but refuse any cut back upon economic development/ all energy transformation must minimize fossil fuels, given the restriction of maintaining a decent level of economic growth. They even dream of large increases in energy supply and demand to decrease poverty and increase affluence.

There appears to be an almost complete reliance from the representatives of states of the world upon the UNFCCC and its Paris Treaty. But can its Goal I, II, III really be implemented? International coordination tends to be sluggish, conflictual and open to renegeing. Civil society is split about climate change, demanding sometimes too much like a totally new economy [11]. The deny of climate change still has their adherents [4-6]. Often global warming is mixed up with general environmentalism, global redistributive justice and big power politics.

Conclusion

The COP23 meeting in the autumn is as vital as the COP21 was. So many issues have to be clarified. And the whole process of implementing the COP21 Treaty must get started. The evidence now indicated sharply growing methane emissions, which are NOT taken into account in calculations of temperature rise.

Relevant now for GWT is public administration and policy-making. Some ideas about the so-called “implementation gap” – Wildavsky’s hiatus – are highly applicable to the COP21 project [12]. The COP21 has three main objectives: halt CO₂ increases by 2018-2020 (Goal I), decrease CO₂ emissions considerably by 2030 (Goal II) and achieve full decarbonisation by 2070-80 (Goal III). But how are they to be implemented? No one knows, because COP21 has neglected what will happen after the major policy decision. The COP21 project outlines many years of policy implementation to reach decarbonisation, but which are the policy tools: market incentives, planning, oversight? COP21 introduces the steps towards a CPR.

A common pool regime, CPR, is vulnerable to the strategy of reneging, as analysed theoretically in the discipline of game theory. The relevant game for the CPR is the PD game, where the sub game perfect Nash equilibrium is defection in finite rounds of play of this game - backwards induction [13]. This is not recognized by Elinor Ostrom [9] in her too optimistic view about the viability of CPR: s. It is definitely not the case that Ostrom has overcome Hobbes (“covenants are in vain and but empty words; and the right of all men to all things remaining”), as one commentator naively declared when she was awarded both the Nobel prize and the Johan Skytte prize (Bo Rothstein’s website 2014). The COP21 project is a CPR that may well fail, either due to defection or lack of management resources and skills. COP21 is in reality a global Common Pool Regime (CPR), responding to N. Stern’s declaration in 2007 of climate change as the largest externality in economic history. However, CPRs in general and the COP21 in particular are far weaker than E. Ostrom [9] predicted.

Gaming by the governments of the world could destroy the efforts at global decarbonisation. The COP21 project houses lots of renegeing opportunities of various sorts, which will become clear as this CPR project moves forward. One major partner has already defected, which may trigger other governments to renege. The only way to control defection in this global CPR is to employ selective incentives, which is what the planned Super Fund could offer, if at all workable.

The only way out of the energy-emission conundrum is the turn to solar power parks and the use of electrical vehicles.

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