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Interview with Adnan Amin, Director-General of the International Renewable Energy Agency (IRENA)

## "IRENA should be a platform where anybody who has good ideas is welcomed"

| By Thijs Van de Graaf

**The prestigious International Renewable Energy Agency (IRENA), brainchild of the late German politician Hermann Scheer, is back on track after a difficult and turbulent start-up period. Under the new leadership of Adnan Amin, IRENA, which boasts 156 member states, seems destined to make a significant impact on the development of renewable energy in the world. In a candid interview with EER, Amin explains his plans for the young, ambitious organization. He does not want to create another bureaucracy and he wants to stay away from politically sensitive declarations. "What we're looking for is practical solutions to real issues that governments are facing on the ground when they want to move forward with renewables."**

EER is meeting Adnan Amin on April 26 in London at the Clean Energy Ministerial, a high-level global forum to promote policies and programs that advance clean energy technology, launched by the US after the Climate Conference in Copenhagen. At last year's edition of this event, which brings together energy ministers from 23 countries, Amin was only present as an observer. This year he got a seat at the table and fully participated in the deliberations. It is a sign of the successful damage-repair work Amin has undertaken since he took over as Director-General from H  l  ne Pelosse in October 2010, at a time when IRENA was in serious financial and organizational difficulties. Governments are beginning to regain their trust and confidence in IRENA. It also shows that the institution is gradually leaving the discussions on its institutional and governance framework behind, and is starting to do substantive work.



**Adnan Amin, Director-General of the Abu Dhabi-based IRENA** (c) Alex Westcott/Gulf News

Amin is widely lauded for putting IRENA back on track after the financial and leadership troubles it experienced in mid-2010. He is a skillful communicator who diplomatically maneuvers around sensitive and contentious issues such as nuclear energy or carbon capture and storage. Born in 1957, Amin is a Kenyan citizen, whose ancestors moved from Pakistan to Nairobi, where they settled themselves among the political elite. His father is a former lawyer and retired judge who was involved in the independence struggle, and his brothers are currently involved in the debate about a new constitution for Kenya. Coming from a developing country has left an imprint on Amin's world view. "The aspirations of developing countries for growth, development, and improving their lives are very much part of my DNA," he acknowledges.

***When you came to IRENA in November 2010, the agency found itself in serious disarray. What did you do to rebuild confidence among member governments?***

My first challenge when I arrived was obvious: we had a collapsing institutional framework, a crisis in terms of management and finances, and major concern among member states about the future of the whole process. I was given four months to create the basis of the institutional structure, the first work program and budget, the rules and procedures, and to hold the first assembly. It was extremely hard work. For the first six months, I did not have a weekend or leave the office before 9 to 10 o'clock at night. It was very taxing and I had to deal with suspicions and aspirations from other people. But we succeeded. I haven't seen any parallel effort in the international system that managed to create something like that in such a short period of time.

***How serious were the budgetary troubles of IRENA in 2010?***

When I arrived the financial picture was very unclear. In fact, my predecessor had talked about the organization being in bankruptcy which turned out not to be the case. The staffing situation was also dire: I had sixteen core staff in the secretariat, six of which had to leave.

**Why did they have to leave?**

Some of them had been playing a role that wasn't entirely appropriate for an international institution. Either that, or they didn't have the skills for the job they were required to do. I don't want to blame anybody so I don't want to go into detail. In any case, we have a limited budget and I don't want to use that budget to create a huge, standing bureaucracy. I want to have a very competent, integrated, tight team in the secretariat that is very capable and knowledgeable about the field. IRENA should not be a framework that does its own programs and competes with other institutions in the field. It should be a platform where anybody who has capacity, ideas, or technical ability is welcomed. I think we've been quite successful in bringing partners to the table and bringing in expertise.

**What are your priorities for the organization?**

I have outlined three priority areas. One was on the global knowledge framework. There are fast-moving developments with respect to renewable energy, creating huge opportunities. Yet, there is insufficient international cooperation around it, so I want to establish a knowledge framework that can support governments' decision-making capacities. The second part of it is: how do we really get a handle on how innovation and technological development processes are taking place? Every week or every month, there are new announcements about possibilities for renewable energy technology, whether it is advances in wind turbine design, blade design, thin film solar cells, or energy storage. I want to set up a capacity that can inform governments about the key developments in innovation, R&D, technology and technology costs. The third leg is that there are many governments that have tremendous technical potential for renewable deployment but lack the institutional, human resource or technical capacity to take advantage of those possibilities. So the question is can we devise a policy advisory framework and capacity-building support framework to enable countries to move forward?

**The agency has been operational for exactly one year now. Can you give an example of a practical result it has achieved?**

Sure. There are many countries in which investment in renewables could take place, but the right regulatory frameworks are not in place. However, nobody has actually surveyed what the potentials and constraints are. So, we decided to undertake what we call "Renewables Readiness Assessments" in emerging markets. We have selected two regions to start with. One is Africa, which has a large number of countries, tremendous economic opportunities, and vast potential for large-scale renewable deployment. And the other is the Pacific Islands, which offer a very different perspective: small-scale, decentralized, resource-constrained but very much in need of energy solutions. We plan to go into those countries and look at their regulatory and legislative framework: do they have a feed-in tariff, do they have targets, do they have sufficient technical and human resource capacity? We will do this together with their national institutions, because we want this to be a nationally-owned exercise. This will result in an assessment of the possibilities and gaps and it will indicate how we can develop some kind of capacity-building effort to support those governments. Essentially, the philosophy is that if you have the technical potential, the right policy framework, and you're able to leverage some public financing, you can really expedite investment.

**Will IRENA also be involved in efforts to secure public financing for developing renewable energy in those countries?**

"I'm trying my very best to ensure that countries like China that are going to be central players in renewable energy are part of the IRENA process" (c) AP

I don't think IRENA will ever become a financing agency or a development bank or anything like that, nor should it. We have a specific mechanism that has been made available to IRENA, which is the pledge of \$350 million for supporting projects in developing countries from the Abu Dhabi Development Fund. We're now developing the parameters around this and we're going to launch the first call to receive applications for funding at the UN Sustainable Development Conference in Rio de Janeiro in June. We know that this kind of international public financing is nowhere near enough for the required deployment of renewables. But what it can do is leverage private investment, de-risk capital and lower the cost of capital. If we can achieve that in a policy framework where investors have long-term perspectives in terms of policies and have guarantees associated with their investments, we think that this can be

transformative.

**The energy ministers gathered here in London have announced the launch of the Global Wind and Solar Atlas, with the involvement of IRENA. What is this initiative about?**

Germany, Denmark and Spain took the initiative for such an Atlas in the context of the Clean Energy Ministerial (CEM). It continues to be a CEM process, but it will be executed through IRENA. Over the next months and years, the Global Wind and Solar Atlas aims to develop a definitive mapping of solar and wind potential globally. More and more countries are coming on board, national atlases are being integrated into it, and we think that we can develop a really powerful resource for solar and wind. I hope that we can add other technologies to that as we move forward, including biomass, hydro and geothermal.

***How do you explain the absence of China in IRENA? After all, China is the world's largest manufacturer of solar panels and wind turbines.***

I have been to China three times since I came to IRENA. We have excellent contacts with all their renewable energy people, institutions and experts. Their absence from IRENA stems from misunderstandings that happened before I arrived at IRENA. I'm trying my very best to ensure that countries like China that are going to be central players in renewable energy are part of the IRENA process. I have a good feeling that we are moving in the right direction.

***Were these "misunderstandings" related to the budgetary problems that IRENA had experienced under the previous Director-General?***

As regards China, there were various issues - on participation, the direction the agency was going, whether it was becoming a kind of standard-setting institution that would impose limitations on them. For Brazil, there was a misunderstanding that IRENA was against hydro or IRENA was against the development of biofuels and biomass. This created suspicion and reluctance. Through the intensive discussions I have been having with both of these countries over the last months, we are overcoming that kind of misunderstanding. I am optimistic that they are looking positively at IRENA. I am hopeful that they will come soon to the issue of membership.

***IRENA is active in a very crowded institutional environment. Its activities overlap partially with those of the International Energy Agency (IEA), the Renewable Energy & Energy Efficiency Partnership (REEEP), the Renewable Energy Policy Network for the 21st Century (REN21), the Clean Energy Ministerial (CEM) and other institutions. What is IRENA's unique selling point?***

Our institutional environment is not as crowded as you might think because each institution was created for a very different purpose. Take REEEP: it was a program established by the UK government after the Johannesburg conference, which has done capacity-building and information exchange, mostly in Africa and Asia. But it has been a fairly restricted framework, with limited resources. If you look at the Clean Energy Ministerial (CEM), this is a political initiative launched by the US bringing together countries representing 90% of global clean energy investment to develop new ideas and partnerships. It's not an implementing framework. If you look at IEA, its membership is limited to the OECD. It has 40 years of experience building up their knowledge base, but it's very focused on energy security issues of relevance to the OECD. It has now begun to expand that mandate, and recently we have seen a far more aggressive effort by the IEA in addressing renewable energy, which is a good thing.

***So you think IRENA's creation has influenced the IEA's openness to the potential of renewable energy?***

Not only the IEA, but also a number of other institutions, including in the UN framework, suddenly stepped up their game on renewable energy. Of course, we can work together with these other institutions. One of the underdeveloped areas of our work program is biomass. I recently had a good meeting with the head of the UN's Food and Agriculture Organization (FAO). The FAO has some interesting approaches to biomass. We bring a different perspective and a different set of technical parameters to that field. There's a potentially very productive partnership between us in the future. I also had a very productive meeting with the executive director of UNEP (United Nations Environment Programme), Achim Steiner, and we agreed to migrate UNEP's Solar and Wind Energy Resource Assessment (SWERA) program into the Global Atlas. So we have productive relationships going on with some institutions. Others, I think, are moving fast to capture some ground in an area where there might be some resource potential for them in the future. But I don't see that as a negative thing or as a disincentive to cooperate with people. On the contrary, I think that both the challenges and the opportunities are so large that there is room for everybody.

***Do you still believe that a global climate deal is possible? And how important would it be for renewables?***

We are faced with a global issue. Science tells us that it is the defining issue of our time, that it is an issue of such physical risk to the sustainability of the earth that action is compelling. One has to continue to be optimistic that a global agreement is possible. Having said that, I have been following those negotiations for more than 15 years, and it is very hard to see whether there's any light at the end of this tunnel. I am convinced that we need practical

solutions to climate change, so it is a wonderful opportunity to be head of IRENA. I mean, this is a no-brainer. We have the technical possibilities for renewable energy, we have the investment possibility for renewable energy, the knowledge is improving, the technology is improving, the prices are coming down. It can be transformative for the energy system. We have a huge opportunity, a limited amount of time and I think that there's a sense of responsibility in IRENA that we have to move very fast with this.

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**Wouldn't it be more effective if the global climate negotiators adopted targets for renewable energy instead of emission reduction targets?**

We have the practical possibilities with renewable energy, but that's not part of the negotiating framework. And I don't think necessarily that it should be. Because while they are negotiating about timeframes and targets, we are talking about investment, technology, jobs, employment - about win-win opportunities for investment and lowering carbon emissions. That is not something for a negotiating framework. It simply presents an opportunity for different countries given their various resource endowments.

**Yet, a global renewables target is precisely one of the recommendations coming out of the High-Level Group on Sustainable Energy for All (SE4ALL) put together by UN Secretary-General Ban Ki Moon, of which you are a member.**

Yes and I think this is a good recommendation. Our early discussions in the SE4ALL group focused on the '30-30 target' of increasing the share of renewables to 30 percent by 2030, which I thought wasn't a relevant one. I was very much in favor of the 'doubling target' - that is, to double the share of renewables by 2030, which makes a lot more sense because some countries will never reach 30 percent since they lack the technical potential, while others such as Germany, Brazil and Denmark are going to be well over 30 percent. Besides doubling the share of renewables by 2030, the SE4ALL group also recommended doubling energy efficiency and ensuring universal energy access by 2030. I hope these three goals are integrated in a larger set of Sustainable Development Goals at the upcoming Rio+20 summit.

**The headquarters of IRENA are located in Abu Dhabi which is one of the largest oil producing countries in the world. Do you think that oil interests and the interests that IRENA stands for are in conflict?**

On the contrary. The fact that a country that makes the vast majority of its income from oil is investing substantially in bringing an international renewable energy agency to its country, was one of the very interesting aspects that encouraged me to come to IRENA. Abu Dhabi is also investing in projects such as Masdar city and the Masdar Institute, a very ambitious effort to create a carbon-neutral city with a state-of-the-art academic institution. They also have large equity investments in renewable energy projects in Europe, the United States, Asia and increasingly Latin America. Admittedly, their domestic target of 7 percent renewables is not that ambitious but their rate of investment globally is quite impressive. It's a visionary idea to have an oil economy becoming a renewables champion. Interestingly, the demonstration effect has been very powerful in the region. Saudi Arabia has just established the world's biggest concentrated solar power plant. I recently attended the launch of a very ambitious solar park in Dubai. Qatar has adopted ambitious targets on renewable energy and is making investments in that area. Oman has been in touch with us about helping them develop their framework for renewable energy investment. Throughout the region, we see renewable energy becoming a major issue. There's an economic logic to this also. These countries are facing a vast increase in the domestic consumption of their oil and that consumption is very heavily subsidized. For every litre of petrol they are selling domestically they are losing money. They can make much more money exporting their oil and using renewable energy domestically for electricity generation, desalination, and cooling. And it makes economic sense for them, because the cost of the petrol subsidies is much higher than the cost for renewable energy investment.

**Then this can also result in those countries selling more oil and gas to the world. Do you view oil and gas as transition or destination fuels?**

In the longer term there is a horizon, and people are beginning to see the horizon for oil. Now, the whole debate about transition or destination, I don't know if these labels are really helpful to look at what is happening in the sector today. We have very dynamic developments. Recently we have seen new developments in terms of exploration and development of shale gas. There's a huge interest in this. For every country, energy security is the

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first priority. Without energy security you cannot assure your development path in a very difficult international economic environment. The whole issue of how you undertake your economic growth responsibly comes in second place. There's a perception, and that still

remains to be tested, that the use of gas could be less carbon intensive than oil. If that's the case, I think it's a good thing, but the jury is still out on that. Gas is going to be a reality for some time. I don't believe all these stories about golden ages of this or that or the other. I think that there are dynamic developments in the global energy mix that are happening. Investments in renewables are driving down cost, and in the future we will see a rapidly increasing share of renewables in the energy mix, but that doesn't mean that gas or oil are going to go away tomorrow.

### ***Does IRENA take a stand in the debate over nuclear energy?***

It's not for us to take a stand on it. What we can look at comparatively is where we think the advantages of renewable energy technology are. For the vast majority of countries, renewable energy is the answer, not nuclear. Nuclear is not feasible for much of the world because of the cost. But there are some countries that have their sovereign national reasons why they are interested in nuclear energy, and it doesn't only have to do with carbon abatement. The most compelling reason is energy security. It's their decision whether they want to take the risk or not. What we've seen since Fukushima, though, is a sea change in the way that governments and public opinion are looking at nuclear energy. That points the way to the future, but it doesn't preclude the fact that there are some countries that are still investing in this.

### ***What about carbon capture and storage (CCS)? Given that CCS is not even demonstrated at a large scale, do you think that it is wise to invest so massively in CCS when you could also invest the same amount of money in renewables?***

The starting point for the discussion is a universal agreement that you need to do whatever it takes to reduce carbon in the atmosphere. Now, there are a number of advocates of CCS who believe that it has the potential of doing that. I think there's still a discussion on whether the volume of investment required to make CCS a reality really justifies the carbon abatement impact that CCS will have or whether we can achieve the same result, or even a better result, through investment in renewables at scale. You know, I don't want to be religious or ideological about renewables, but the real problem that the international community is facing is the speed at which we need to deal with carbon: it simply requires multi-faceted solutions. While renewable energy is growing, it is not clear that it can grow fast enough to achieve the kind of carbon abatement effects that we need, and whether CCS offers an additional technology to achieve that objective is unclear. Clearly, we as advocates of renewables are very much on the side that if we had ambitious investment in renewable energy to scale, we could make this a reality. If the world would start to make use of the technical potential that is available in hydro, geothermal, biomass, we can achieve a very rapid reduction in carbon. But, while renewables have been growing, we're not yet sure that they can achieve that result in the time required, so I think that's why there's still interest in nuclear and CCS.

***I don't believe all these stories about golden ages of this or that or the other***

### ***If you're not quite sure at which pace renewables can grow, wouldn't it be a good idea if IRENA would start producing scenarios like the IEA does?***

Well, I think we need to do that but we need to have the capacity to do it in a very serious way. We're moving into that direction but we're not yet there. One problem with scenarios is that everybody is doing them. There's a cacophony of scenarios. It is becoming counterproductive because it begins to dilute the policy relevance of what scenarios should really be about. We don't want to do a scenario until we are sure that we have the right knowledge framework to do a meaningful one. But in the meantime, I think what is a very productive way for us to proceed is to develop an authoritative sense of what the outlook for renewable energy is in the short and medium terms. Many of the reports you see out there are retrospective. They say: how much investment was there this year, how much additional capacity was added this year, and so on. What we can do is take a very analytical look at what all of this adds up to, as a whole, globally and broken down in different regions. What's missing, what's moving, what are the possibilities? As part of that exercise, we should take every year a set of the key issues that are out there around renewables which need to be addressed by the international community. For example, we have now the financial and economic crisis, and the whole issue of reduction of support for renewables. What does it really mean? In some instances, it could be a good thing that you allow renewables to compete in the market place because their costs are coming down substantially. There is a kind of unreasonable expectation that subsidies for renewables would be there forever. In principle, the very idea of subsidies is a distortion of the market. But, at the same time, we need to address very fundamentally the fact that we are giving massive subsidies to fossil fuels and to nuclear. Everybody talks about renewables competing on a level-playing field, but then make it happen! And there are other issues that we can address. What is it going to take for large-scale investment in renewables to happen in emerging economies? What are the prospects for technology? Where are the technology cost curves going? What are the innovations happening in technology, the possibilities of storage? So, we need to do a much more analytical work on these kinds of issues and maybe every year we can examine one region in a little more depth.

**IRENA has a budget of \$28.4 million for 2012. You've been quoted by Reuters, saying that, for the type of work you're thinking about, the optimal budget would be about \$250 to \$300 million. Do you think such a growth in the budget is realistic?**



**The late Hermann Scheer at the founding conference of the IRENA** (c) Solar Power Ninja

I have immediately called this reporter and I said: what is this nonsense? I was talking about \$250-300 over a medium term perspective of 5 years. And he put this in the headline of an article just before our first Assembly saying that I'm asking for 250-300 million. That was not a helpful article, I must say. I think the scale at which the agency grows will be directly proportional to the impact it has on action at the country level. If we do it the right way, we will have a growth path. Last year, we were the only international organization in the world to get a 20 percent increase in our budget. I think that's a very important signal. Of course, we're growing from a very low base and 20 percent in absolute terms is not huge but it's still a very significant political signal about how people see the future of this organization. I think we will be stable for another year

and I think that once we start coming out of the difficult economic conditions and the institution starts fully developing its abilities, we will see a growth period.

### **Will IRENA migrate into the UN structure one day?**

There has been some informal discussion about that. Basically, there are two different views. A large part of the membership is not necessarily opposed to it, although there hasn't really been a discussion on the pros and cons. But there is a segment of the membership, including a few important developed countries, that believes that IRENA should stay outside the UN system because that enables it to distance itself from the kind of political polemic that is endemic in discussions at the UN, and to focus on practical solutions without the kind of institutional constraints that they feel the UN might impose.

### **And yet, IRENA has adopted many of the governance procedures that are commonly found in the UN system.**

Indeed, we have an intergovernmental structure and many of our procedures are similar to the UN's. But what we're really trying to do with IRENA is to design a new institutional setup for the twenty-first century. Take a look, for instance, at the ongoing discussions in the preparation of the Rio+20 summit. At the moment, they've arrived at a 500 page document with more than 1200 brackets, the so-called "Zero Draft". And that is only after several months of negotiation! What we are doing in IRENA is not negotiating long, politically sensitive declarations. What we're looking for is practical solutions to real issues that governments are facing on the ground when they want to move forward with renewables. I absolutely want to avoid any kind of bureaucratic inflexibility. At IRENA, we have very effective but light oversight management mechanisms. I don't want to establish a huge, permanent bureaucracy but I want to have an evolving structure where expertise is brought in as needed.

#### **About the author**

Thijs Van de Graaf is a post-doctoral researcher at the Ghent Institute for International Studies, Ghent University. His research interests include global energy governance and international energy politics. With Dries Lesage and Kirsten Westphal, he co-authored *Global Energy Governance in a Multipolar World* (Ashgate, 2010). His recent publications include 'Punctuated Equilibrium in the Energy Regime Complex' (Review of International Organizations, June 2012, co-authored with Jeff Colgan and Robert O. Keohane), and 'Obsolete or Resurgent? The International Energy Agency in a Changing Global Landscape' (Energy Policy, forthcoming). For European Energy Review he recently wrote an analysis of IRENA: "How Irena is Reshaping the Global Energy Architecture".

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**Contributions**

tlt.iss

*hr.usps.lane*

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**Hugh,**

I'll be looking forward to your economically-viable energy storage solution in about a year.

Will it be utility-scale units or widely-distributed units? What will be the cost, useful service life and time frame for implementation?

PS. The captcha can be set at different levels of glibberish. Let us hope, Karel selects the lowest, least frustrating level.

*Willem Post*

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**Willem,**

Thank you for this useful contribution. In fact, we must thank Eirgrid for its invaluable contribution to openness and transparency by publishing this data and for having the courage to attract analysts like Fred Udo and myself to dig inside numbers to find out what they are telling us.

These data are particularly valuable because they describe a closed system, so there can be no "fudging" and self-delusion as occurs in for example Denmark which generates but does not consume any more than half of the 25% of its electricity from wind power. When I published an analysis of the use and cost of Danish wind power in 2009, the wind power establishment here did its very best to crush my findings. One of these was that we Danish consumers, by paying feed-in tariffs to the wind turbine owners who sell their power into the Nordic spot market at a fraction of the tariff they are paid, are in fact subsidizing Norwegian and Swedish consumers. In other words giving "foreign aid" to the Nordics!

The UK is also a closed system (more or less). My analysis shows that the UK's "optimum" wind power capacity will peak at 10 - 15 GW, far below the absurd 30 - 40 GW which are at present the target of HM Government.

We have done our best to draw the attention of the UK's politicians to this but the power of the "green" lobby is overwhelming, for the time being. The danger is that further £billions of money that the UK must borrow will be squandered to achieve these pointless "targets".

Eirgrid's down-loadable, time-series spreadsheets, go back to November 2010 for wind power, CO2 and demand.

Start at <http://www.eirgrid.com/operations/>

I hope that other analysts will continue the good work started by Fred and myself.

By the way, Willem writes that "...intermittent wind" requires backup by quick-ramping, open cycle gas turbine generators that ramp up when wind energy ebbs and ramp down when wind energy surges...".

That's not quite true.

Electricity storage, whether located centrally or distributed, if built in commensurate quantities to wind (and solar power), can address wind intermittency much more efficiently than OCGTs. I know because I am EU Director for sales and marketing for [www.pdenenergy.com](http://www.pdenenergy.com) where we aim to deliver distributed storage at a cost which is highly competitive with new pumped storage. All inside a year.

Karel, when are you going to do something about these pesky, absolutely illegible captcha?

*Hugh Sharman*

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As a follow-up to the above comment, I present the following example:

Because wind energy is variable and intermittent, it requires backup by quick-ramping, open cycle gas turbine generators that ramp up when wind energy ebbs and ramp down when wind energy surges which occurs at least 100 times per day. Such part-load-ramping operation is inefficient and requires extra fuel/kWh and emits extra CO2/kWh. The extras mostly offset what wind energy was meant to reduce, as proven by analysis of the Eirgrid, Texas and Colorado grid operations data.

What makes wind energy even less attractive is that some recent studies show CO2 emission reductions due to wind energy are not anywhere near to what is claimed by promoters. These studies are based on 1/4-hour and 1-hour grid operations data.

Energy systems engineers, with decades of experience analyzing energy systems, have analyzed the real-time, 1/4-hour grid operations data published by EirGrid, manager of the Irish grid:

- CO2 emissions
- wind energy produced
- total energy produced

The engineers were expecting a CO2 emissions reduction of 70 to 90 % of the values claimed by wind energy promoters. Their usual claim (without any measurement) is a 1:1 ratio, i.e., one MWh of "clean" wind energy offsets one MWh of "dirty" fossil fuel energy and its associated CO2.

However, the engineers were surprised these measured data showed so little a reduction of CO2 emissions compared to what was claimed.

For example, it was found 12% of wind energy on the grid caused only a 4% reduction of CO2 emissions, i.e., the CO2 emissions reduction was only 1/3 of the claimed reduction for this share of wind energy.

It was also found the greater the wind energy % on the grid, the lower the ratio, i.e., adding more wind energy becomes less and less effective for CO2 reduction, and that the ratio will ultimately go to zero and then become negative, i.e., adding more wind energy to the grid will INCREASE CO2 emissions. This trend is due to more and more generating units on the grid being inefficiently operated in part-load-ramping mode.

See Section 4. of <http://www.clepair.net/lerlandUdo.html>

This situation has led to a carefully-orchestrated spell of deception and delusion by government leaders and wind energy promoters.

The deception: The above shows that too many renewable energy certificates, RECs, are being granted to wind energy producers than is warranted based on their CO2 reduction.

The delusion: People have been led to believe by government leaders and wind energy promoters that wind energy is "doing something about climate change". It turns out the net effect is much less.

<http://theenergycollective.com/willem-post/64492/wind-energy-reduces-co2-emissions-few-percent>

<http://www.clepair.net/lerlandUdo.html>

<http://docs.wind-watch.org/BENTEK-How-Less-Became-More.pdf>

<http://www.clepair.net/windSchiphol.html>

<http://www.clepair.net/Udo-okt-e.html>

<http://www.clepair.net/Udo-curtail201205.html>

*Willem Post*

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And another element is missing in the description of the IEA. Yes it is a members organisation BUT the Implementing Agreements (now renamed "Technology Initiatives") are open to all countries and even other participants as sponsors and with equal rights for them all to the results of the work.

There are several such co-operations within the iEA that cover all aspects on renewables and energy efficiency. Check it out <http://www.iea.org/techno/index.asp>

*Hans Nilsson*

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One element is missing regarding the discussions of CO2 emission measures which is the requirement that CO2 emissions first be measured and publicly reported before it is allowed to claimed a reduction by anyone entity.

The public would feel more comfortable if the CO2 emissions reduction process is public and verifiable, instead of having unverifiable claims made by RE promoters.

Such a requirement would enable the ranking of RE technologies regarding investment effectiveness.

Further, energy efficiency should be elevated to RE rank and have access to the same incentives and judged by the same criteria.



If that were done, it would be quickly apparent EE is THE way to proceed in most instances, BEFORE embarking on RE.

*Willem Post*