

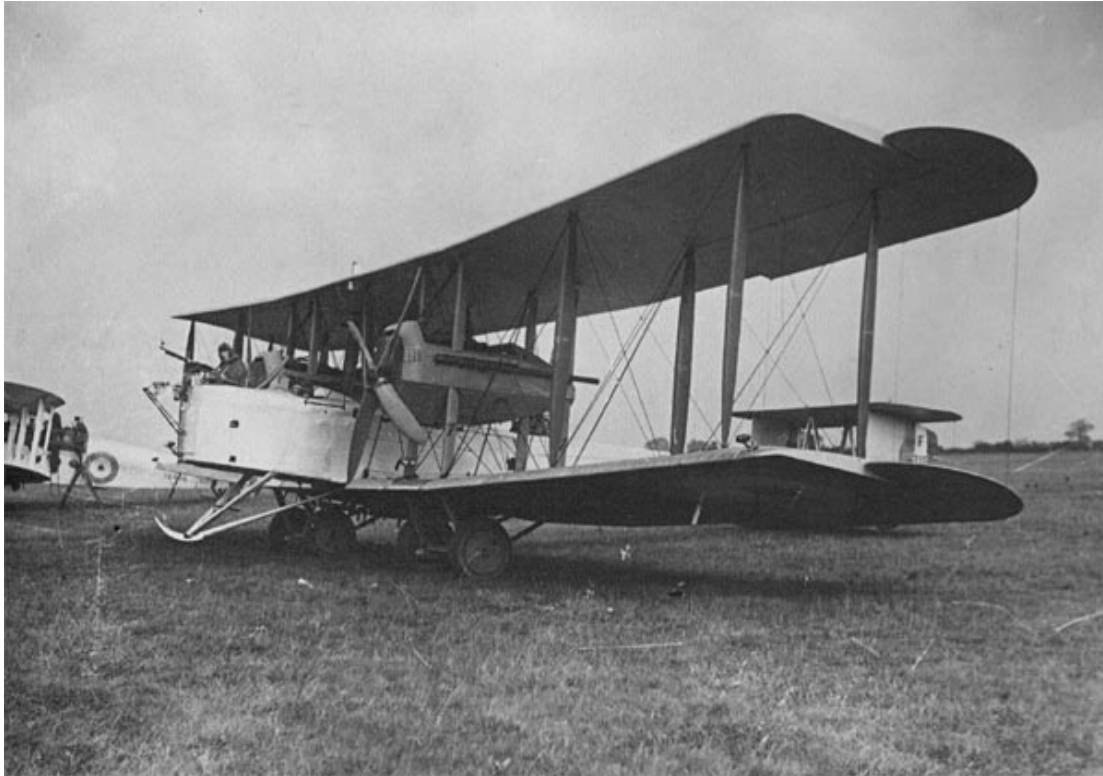


Rewarding results: how should we support the development of renewables?

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In 1913, Lord Northcliffe, who owned the Daily Mail, offered £10,000 to the first men to fly the Atlantic from North America to Ireland or England in less than 72 hours. The prize was won by John Alcock and Arthur Brown, who flew non stop from Newfoundland to Ireland in June 1919 on a modified Vickers Vimy bomber. Later on, in 1927, Charles Lindbergh flew non stop from New York to Paris, collecting another prize for the result. Awarding prizes is a good way of stimulating technological development, with the added advantage that you pay for success and not for failures. Should we use the same strategy for renewable energy?

Bill Gates has recently stated [in an interview](#) that

The irony is that if you actually look at the amount of money that's been spent on feed-in tariffs and you properly account for it--tax credits, feed-in credits in Spain, solar photovoltaic stuff in Germany--the world has spent a massive amount of money which, in terms of creating both jobs and knowledge, would have been far better spent on energy research.

This opinion is fairly often heard when discussing renewable energy. But would it really be a good idea to spend public money financing research on renewables? Would it produce breakthroughs, jobs and new products, or would it just create more "welfare queens in white coats?"

The way scientific research is managed by governments is by means of "research grants." Governments decide the themes on which research should be performed and invite scientists from academia or private research centers to apply for funding by presenting proposals. In many cases, research grants contain provision that should insure that the results of the research are aimed at obtaining some kind of marketable product, which is also the way of creating jobs. But that is a very difficult task. Not that scientists are not good at what they do. They are - usually - hard working, competent and dedicated. The problem is that awarding grants to scientists is a little like voting for politicians: you pay for promises, not for results.

Scientists may not be so bad at maintaining their promises as some politicians are; but the way to be sure to keep a promise is not to make it or - at least - to word it in such a way that you can always say that you have kept it. In the case of research grants, that means that the objectives are always very conservative. That makes both awarders and awardees happy, since neither one wants failure. But it is not the best way to obtain breakthroughs or innovations of the marketable kind.

In addition, the mentality of scientists is not normally directed to market. They pay great attention to their internal pecking order; something that they establish by means of arcane procedures which have to do with "impact factors" "citation indexes" and the like. The scientific community is akin to those societies that anthropologists have termed as "gift-giving;" that is, societies where your social worth is determined by how much you give away for free. That's what scientists do all the time: they gain prestige by giving their papers for free to the community. But, in a world where there holds the "publish or perish" rule, you can see how difficult is to be a scientist and an entrepreneur at the same time. As a scientist, you are supposed to give away your results for free. As an entrepreneur, you want to keep them for yourself and make money from them. Intellectual property can be managed, but this contradiction can never be completely solved.

So, if you want to get something that works and that can be sold; well, creativity is not something that money can buy so easily. Think about the first plane; the one made by the Wright brothers in 1908. It was the work of a couple of inventive men who used their own money for the project. And that while university professors were still debating on whether planes could actually fly. Today we are seeing something similar with [high altitude wind energy](#), which could be a real breakthrough in renewable energy. The researchers working at [the kitegen project](#) have applied several times for research grants from the European Commission. Their requests have been systematically turned down. The grant system is not just conservative; it is actually innovation-averse.

All that doesn't mean that public money spent on research on renewable energy would be wasted, it is just that it is hard to think that it would produce breakthroughs or really innovative new products in ways proportional to the effort. So, if we need, and we do need, better renewable technology, we should select appropriate ways to promote real innovation in this sector. So, why not learn from aviation? There was a period, during the first decades of the 20th century, when a lot of progress in aviation was made using the "prize" system. That is, some well meaning individual would offer money for the first one who would accomplish a specific task: crossing the Atlantic Ocean, fly non-stop from New York to Paris, and the like.

As far as I know, there are no quantitative studies about the efficiency of this system but, from what we can read, it did stimulate people to work very hard on getting the prize - Charles Lindbergh is a good example. Working for a prize stimulates people who are naturally competitive, and they can express themselves much better than when they have to follow the pre-laid Gantt chart of a typical government sponsored project. And, from the viewpoint of the awarders of the grant, there is the obvious advantage that they pay for results, not for promises. They pay only for success, not for failure. And success speaks for itself; you don't have to set up

So, it would be thinkable to organize research on innovation in renewables by offering prizes. Say, the government will award 10 million dollars to the first research lab which succeeds in developing a solar cell with a demonstrable EROEI = 50 (about the EROEI of petroleum in the golden days). Or it will award the same 10 million dollars for the first GWh consistently produced by a high altitude wind power system. Maybe the target is too high, and nobody will succeed in getting the prize, but if that happens, it is at no cost for taxpayers. And think how much money the governments could save dismantling the overblown bureaucracy needed for selecting grant applications and checking that the money is spent according to the promises.

Now, why is it not done? Well, I think the reason lies in those lines that I just wrote. The main purpose of all bureaucracies is to perpetuate (and enlarge) themselves, so a reform that would get rid of a large number of government bureaucrats is almost inconceivable. Maybe there are other reasons that make it difficult to stimulate research using prizes, but I do know that there are cases in which public money has been used to reward success: it is the case of feed-in tariffs for renewables.

In the early times of PV, governments would support renewables by paying a fraction of the cost of the plants. That was a mistake: if you give people money for the plant, that will be no incentive for the plant to be efficient. Actually, it will be an incentive to buy oversized plants and to pay too much for them. That period saw some considerable squandering of public money, at least for some cases I know of in Italy.

Instead, think about the feed-in tariff. The government pays you in proportion to what you produce; that's a tremendous enticement to be efficient, to use the best technology and to bargain to get the best prices for the plant. It is, in a way, a prize. The government pays for success - if your plant is no good it is bad for you, but not for the taxpayer. And success speaks for itself: the government doesn't need to pay people to check that your PV panels are real panels and not wood planks painted in blue.

So, I believe that the feed-in tariff, so much criticized by Gates and others, has been an excellent idea; a rare case, nowadays, on the part of governments. The rapid development of renewables - both in total power installed and efficiency - of the past years has been the result of this idea. Of course, as renewables grow, we need to adapt tariffs to the progressively larger fraction of energy created by renewables. But, on the whole, we are doing very well and we should think twice before we try to fix something that works.



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