

# A Green Impact Fund

*Thomas Pogge*

In *Accountancy Europe's* [Call for Contributions](#), Paul Tang raises the important question how revenues from emission taxes might be spent in a way that can win and sustain public support for them. His answer: “A climate-dividend to all citizens could be a simple way to guarantee support for the transition amongst all our citizens.” I fully agree with this proposal and would suggest implementing it as a flat per-capita tax credit for households below a certain income.

In this note, I sketch another proposal for spending some of those revenues in a way that would be well-received by the public. The key idea is to create a **Green Impact Fund (GIF)** that would invite innovators to forgo conventional licensing fees and monopoly markups<sup>1</sup> on any new green technology in exchange for six annual payments based on its impact in reducing emissions.

Fed by emission tax revenues, the GIF would commit to make, in each future year, a disbursement, whose size might be defined as a fixed or gently rising €-amount. Any patentable green technology could be registered with the GIF. Registration involves the innovator's commitment either to offer cost-free licenses to manufacture, sell and use its innovation or to sell the innovative product at or below variable cost of supply. This contractual commitment would extend beyond the end of the reward period.

In exchange for giving up all profits from its licensing or sale, the registered innovation would participate in the next six annual disbursements, each divided in proportion to the emission reductions achieved with the participating innovations in the preceding year.<sup>2</sup> GIF scientists and statisticians would perform the relevant assessments based in part on audited company data about each innovation's international use. An appropriate assessment fee would be subtracted from each annual reward payment.<sup>3</sup>

Each year, the GIF would reward averted emissions at a uniform rate (in € per metric ton of CO<sub>2</sub>e). Emerging through market forces of supply and demand, this rate is self-adjusting. When it is perceived as unattractive by innovators, registrations dry up and the reward rate rises as older innovations exit at the end of their reward period. When the reward rate is perceived as highly attractive, registrations proliferate, and the reward rate declines.

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<sup>1</sup> “Markup” is defined as the gap between product price and variable cost of supply. When a product is protected by patents, which suppress competition, then its profit-maximizing markup is typically substantial.

<sup>2</sup> Such reductions could be assessed in metric tons of CO<sub>2</sub>e or CO<sub>2</sub>equivalent, a scale that weights all greenhouse gases relative to CO<sub>2</sub> according to their global warming potential over some specific time frame.

<sup>3</sup> Charging assessment costs to innovators, rather than covering them from the GIF's general budget, has the advantage of discouraging registration of innovations with only small expected benefit.

The reward rate is inversely related to the length of the reward period. The preliminary choice of six years is driven by the thought that, as the reward period is lengthened, the incremental gain in making total rewards more accurately reflect each innovation's true long-term value diminishes to the point where it no longer justifies the associated increase in cost and complexity of the annual assessment exercises.

Six years seems a fair compromise. It would allow innovators to recoup their fixed R&D expenses and turn a profit faster than under the patent system and might thereby accelerate the pace of innovation.

With annual disbursements in the billions, the GIF's reward rate would be stable over time, with a slight upward bias as the most cost-effective innovations are likely to be prioritised. This reward rate would guide innovator decisions about whether to undertake particular R&D projects and about whether to GIF-register particular innovations achieved.

The reward rate would also measure the GIF's own performance and thereby guide decisions by politicians and citizens about whether to increase its budget and thereby to enlarge the flow of GIF-registered green innovations.

The GIF would organize a wide competition across the whole vast range of green technologies, sustaining a broad quest for innovations that promise the most cost-effective emission reductions. Many of these lowest-hanging fruits are innovations that would be poorly rewarded under the monopoly patent regime.

Such "underrewarding" occurs when an innovation has large third-party benefits that buyers care little about, or when it particularly caters to low-income users who are not in a position to pay hefty markups.

The first case is illustrated by innovations averting harms that are widely dispersed geographically and into the future. The second case is exemplified by products specially designed for impoverished populations – such as a cheap, fuel-efficient, low-polluting stove for indoor heating and cooking, or a rechargeable electric motor scooter. Such innovations could have a much larger market among the world's poor if their price were uninflated by intellectual-property markups.

The GIF would not merely incentivize R&D on high-impact innovations that, under our monopoly patent regime, are unprofitable. It would also diffuse innovations far better than the patent system, which rewards innovations in a way that impedes their spread. Because large markups prevent many mutually beneficial sales, the patent system generates massive deadweight losses plus—even more harmful—immense ecological losses through underutilization of existing innovations.

Coal-fired power plants present an example of this problem with special relevance for low- and lower middle-income countries (LLMICs). India used subcritical technologies when the frontier was supercritical, and then started adopting supercritical ones when the frontier was ultra-supercritical.<sup>4</sup> These decisions caused large efficiency losses and increases of up to 30% in CO<sub>2</sub> emissions.

One reason for not adopting the frontier technologies was that they are covered by many patents: Google Patents shows 3,584 results including the terms “ultra-supercritical” and “coal”. Such patents entail substantial disincentives. For example, in 2009, Chinese coal-fired plant builder Harbin Electric paid licensing fees of \$1.5 million for each boiler it produced with Mitsui Babcock’s patented technology.<sup>5</sup> These fees were set to capture much of the technology’s future fuel cost savings.

Rather than transfer such expected savings to the new technology’s patentee in advance, the plant operator may well then prefer to use the older, inefficient technology, as happened in India, where failure to adopt more efficient technologies resulted in an additional 1.5 million metric tons of CO<sub>2</sub> emissions per year per plant.<sup>6</sup>

GIF incentives would dramatically transform innovator attitudes. While patent rewards turn innovators into jealous spies in search of possible infringers, impact rewards encourage innovators actively to promote widespread and effective deployment of their registered innovation with an eye to optimizing its impact. Such innovators would not merely charge nothing for the use of their innovation but would invest in teaching users to make optimal use of it, installing it for free, subsidizing it to poor buyers—if and insofar as the increase in impact rewards earned from such investments is expected to exceed their cost.

A large share of the added diffusion achieved by the GIF would occur in LLMICs. These gains would come cheap because the opportunity cost for innovators is small: there is not much demand in poor countries for high-priced green innovations because people there don’t have money to spare and plausibly believe that it is not their responsibility to mitigate a climate emergency that the industrialized countries have unleashed.

Yet, the ecological gains from added diffusion of green technologies in the LLMICs are enormous. In the remainder of this century, LLMICs will experience substantial population growth with massive expansion of traffic, agriculture and consumption of energy, steel, cement etc. The technologies they will use in this expansion, the practices and habits they will

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<sup>4</sup> Ian Barnes. *The Prospect for HELE Power Plant Uptake in India* (IEA Clean Coal Centre, November 2016), at [https://usea.org/sites/default/files/The\\_prospects\\_for\\_HELE\\_power\\_plant\\_uptake\\_in\\_India\\_-\\_ccc271.pdf](https://usea.org/sites/default/files/The_prospects_for_HELE_power_plant_uptake_in_India_-_ccc271.pdf), p. 4.

<sup>5</sup> Tan, Xiaomei et al. 2010. *Scaling up Low-Carbon Technology Deployment: Lessons from China*. Washington, DC: World Resources Institute, at: [http://pdf.wri.org/scaling\\_up\\_low\\_carbon\\_technology\\_deployment.pdf](http://pdf.wri.org/scaling_up_low_carbon_technology_deployment.pdf).

<sup>6</sup> Evans, Simon, and Rosamund Pearce. 2020. “Mapped: The World’s Coal Power Plants.” Carbon Brief, at <https://www.carbonbrief.org/mapped-worlds-coal-power-plants>.

form, the roles they will be prepared to play in the fight for a livable planet—all this will have far greater impact than any choices industrialized countries will make within their own borders.<sup>7</sup>

By giving LLMICs free access to GIF-registered innovations and by rewarding their deployment there, we would greatly help green the LLMICs' development, incentivize local R&D to deal with locally specific emission sources and build much goodwill in the spirit of Sustainable Development Goal #17.

Those who pay European emission taxes toward funding the GIF would be happy to see all GIF-registered innovations available at generic prices throughout Europe, as this would make it cheaper for them to meet their legal obligations and ethical responsibilities in regard to the climate emergency while also improving their environment (by reducing air pollution, for instance).

They would also be happy to see the LLMICs fully included, as this would multiply the ecological benefits achieved with the typical GIF-registered innovation while reducing registrations only slightly.

European taxpayers would not be pleased to see other affluent countries get a free ride. The GIF should therefore be designed to offer such countries a choice: They may contribute to the cost of the GIF on roughly the same terms as European countries (though their contributions would not have to be funded from emission taxes) and then get access to an—enlarged—portfolio of GIF-registered innovations without monopoly markups.

If an affluent country declines, innovators would remain free to charge, in this country, licensing fees and/or monopoly markups on their GIF-registered innovations. Leaving innovators this freedom would reduce their opportunity cost of registering, thus attracting more registrations and thereby lowering the reward rate and raising the cost-effectiveness of the GIF. It would also provide incentives to non-European affluent countries to contribute to, and thereby to expand, the GIF.

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<sup>7</sup> To illustrate. Sub-Saharan Africa's electricity production will increase dramatically as its *per capita* consumption – currently about 2% of the EU level – will catch up and its population will increase from the current 1.1 billion to about 4 billion by 2100.