

# Green energy financing

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**Your energy finance research has highlighted major challenges in clean energy financing, especially the financing of green and renewable energy, and points to broadly practical solutions. What led you on this path?**

Ten years ago, my research focused mainly on the economics of fossil fuels, the impacts of energy price fluctuations on macro-economic variables and oil price determination. In the past five years, I have focused more on green energy, sustainability and energy transition because I found that these are more important and essential for achieving the sustainability and climate-related goals.

Renewable energy projects have more difficulties compared to fossil fuel projects in accessing finance. Several risks associated with renewable energy projects means that private investors are still reluctant to invest in these projects. My research mainly focuses on how to bring private investment and private finance to these types of projects, working on designing financial instruments, and assessing the effectiveness of different instruments, policies, rules and regulations in promoting investment into green and environmentally friendly projects, which is known as green finance.

**What are the newest challenges in progress on green energy financing?**

Unfortunately, one of the most disappointing aspects of the contemporary global economy is the low rate of investment in sustainability projects. The global community has set goals, such as the Sustainable Development Goals, the Paris Agreement on climate change and several other international goals. However, the current level of investment in renewable



energy projects and energy efficiency projects is insufficient to achieve these goals. In addition, in the wake of the COVID-19 pandemic, because of the uncertainty and the economic recession and because the future is not very clear for investors, new investment in these types of projects reduced even more, so it means that the situation is even more serious, compared to pre-COVID-19. So the goal of the research is how to fill this finance gap.

**Many institutions now focus on green investments, but how do they standardize or rate these?**

When we look deeper into these investments, we see a serious issue with greenwashing. When a company, institution or investor mentions their green investment, it doesn't necessarily mean they are concerned about sustainability. Governments of the major emitters, such as China, the US, Japan and the European Union, have taken necessary steps to achieve carbon neutrality and also to facilitate green finance and issuing of green bonds. But when investors purchase green bonds, it is unclear whether the money they are investing into the financial asset is really going to green projects or not. There is a lack of supervision from the side of governments on assessing the greenness of these investments.

One of the biggest issues is the lack of green rating agencies. In the financial markets, there are several credit rating agencies, such as S&P, Moody's and Fitch, which assess the credit risk of companies. For example, given that the project credit risk is very low and almost zero, its credit rating is AAA, or AA+. We need independent institutions to assess the greenness of projects and companies and to rate them based on their level of sustainability and greenness. An individual, corporate or institutional investor would then have a clearer idea and confidence of whether their money is really going to the right place or whether it's just greenwashing.

**What are the ways to reduce risk and increase the rate of return of green projects?**

Credit risk is one of the major risks that prevents investors from investing. To solve this matter, we designed the green credit guarantee schemes that cover the risk of lending to green projects so that banks and financial institutions will show more eagerness to lend to green projects. We have shown theoretically and empirically how a green credit guarantee can reduce the credit risk and unlock the private investment in green projects. To increase the rate of return of green projects, a possible solution is a carbon tax that is collected from polluting industries and that can be directed to green projects, for increasing the rate of return of these projects. Another policy we proposed is using the spillover effect to increase the rate of return of renewable energy projects, which I'll explain. The government often regulates electricity tariffs; this makes it difficult for private financial institutions to finance electricity projects. Electricity supply from renewable energy sources in an unelectrified region will bring factories and businesses to the region. Due to the power supply, the region's economy will flourish (spillover effect of the power supply). New residences will be constructed, and property values will rise. The corporate tax, income tax, property tax and sales tax will increase along the electrified region; this is called the spillover tax. Either local or central governments usually collect all these spillover tax revenues without returning them to investors in energy projects. If part of the spillover tax revenues returns to private investors, the

rate of return of green energy projects would increase and bring new private investments into these projects.

### **How does the size of a corporation or enterprise affect carbon taxation?**



Regarding carbon taxation, large enterprises, such as automobile manufacturers, steel and cement companies or petrochemical companies, that are polluting and need to be cleaned up receive the majority of the attention. Many governments are neglecting small- and medium-sized enterprises (SMEs). I think both are important. If we place carbon taxation rules only on large enterprises, then the competition is unfair, and SMEs would escape from these rules. Rules and regulations – or incentives – need to be for both groups of companies, not only for large companies but also for SMEs that are shaping a significant part of the economies in many countries. For example, in Japan, almost 50% of the GDP comes from SMEs. In China, South Korea, India, the US and Europe,

SMEs are very important. So this is one thing that needs to be addressed: when there is a rule and when there is a cost on pollution, all groups of companies need to be treated equally.

### **How can shareholders or investors provide incentives or advocate for sustainable investments?**

Firstly, private companies can have a significant role in the energy transition and in achieving carbon neutrality. Most companies care about the profits of their investments, except impact investors or those companies with a mission toward the environment and sustainability. Impact investments generate a measurable social or environmental impact alongside a financial return. If sustainability projects are profitable, then more companies will show interest. Secondly, I believe that for large companies, especially stock listed companies, impact investment demand should come from shareholders. For example, if I'm a shareholder of company 'A', I would like this company to

care about the environment and social values in addition to financial return. So it means that when I'm looking at the annual report of company A, I don't, as a shareholder, just check the sales or profits, but I also seek information about whether they performed environmentally friendly activities, reduced the level of carbon emissions, and are good in social activities and in gender equality, and have enough, for example, female board members. Shareholders can have a significant role in transitions to sustainability, and they should be demanding and asking large companies to care more about sustainability goals.

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### **Competing interests**

The author declares no competing interests.