CREST

CENTER FOR RESEARCH
IN ECONOMICS AND STATISTICS

Post-doc offer: green finance / quantitative economics

Scenario-based climate risk analysis for energy transition

Context A major challenge for energy transition is to reallocate the capital, in particular that of the private sector, to renewable energy infrastructure projects. Such reallocation cannot take place without a precise estimation of the risks of energy transition projects, which will allow, on the one hand, to reduce the costs by lowering the risk premium, and on the other hand, to develop a system of public guarantees for such projects with a well-defined cost for the taxpayer. The post-doc is offered in the context of SECRAET project whose goal is to develop a methodology for measuring these risks. SECRAET is a collaboration between CREST, CIRED, SMASH, Louis Bachelier Institute and Crédit Agricole, partially funded by ADEME.

Description The goal of the post-doc is to develop a methodology for evaluating the risk of investments into energy infrastructure projects, based on uncertainty estimates from integrated assessment model (IAM) scenarios. This will involve

- Quantifying the effect of technological uncertainties as deduced from IAM scenarios on the balance sheet of involved actors.
- Classifying the risks into those of probabilistic nature, which can be modelled and hedged, and the non probabilistic uncertainties, where dynamic flow of information does not play a major role, such as technological shocks.
- Determining the dynamic risk management strategies, depending on the information flow as well as the risk measures (such as Value at Risk) for different investor types. At first, the analysis will be carried out for individual investors, and in the second stage, interactions between investors will be taken into account.

Candidate background The successful candidate will have (or be very close to obtaining) a PhD degree in quantitative economics, applied mathematics or finance, accepted or published papers in leading journals of his/her domain, experience in data analysis, and a strong interest towards climate economics / climate finance. Experience with integrated assessment models and/or financial risk management and knowledge of python/pandas is a plus.

Administrative details The proposed position will be offered for **two years** and based at CREST/ENSAE (Palaiseau). The candidate will be expected to regularly collaborate with researchers from other partner institutions of the SECRAET project. To apply, please send your CV with a list of publications and the names of at least two references, together with a brief cover letter to Peter Tankov (`peter.tankov@ensae.fr`). Applications will be considered until a suitable candidate is found, and the contract will start beetween February and September 2020, depending on the candidate's constraints.

Bibliography

1. Battiston, S., Mandel, A., Monasterolo, I., Schütze, F., & Visentin, G. (2017). A climate stress-test of the financial system. Nature Climate Change, 7(4), 283.

2. Dietz, S., Bowen, A., Dixon, C., & Gradwell, P. (2016). Climate value at risk of global financial assets. Nature Climate Change, 6(7), 676.

3. Marangoni, G., M. Tavoni, V. Bosetti, E. Borgonovo, P. Capros, O. Fricko, D. E. H. J. Gernaat, C. Guivarch, P. Havlik, D. Huppmann, N. Johnson, P. Karkatsoulis, I. Keppo, V. Krey, E. O Broin, J. Price and D. P. van Vuuren. Sensitivity of projected long-term CO2 emissions across the Shared Socioeconomic Pathways. Nature Climate Change 7, 113-119.

4. O Broin, E., Guivarch, C. 2017. Transport infrastructure costs in low-carbon pathways. Transportation Research Part D : Transport and Environment 55, 389-403.

5. Guivarch, C., Rozenberg, J., Schweizer, V. (2016). The diversity of socio-economic pathways and CO2 emissions scenarios: Insights from the investigation of a scenarios database. Environmental Modelling & Software 80, 336-353.

6. Hourcade, J. C., Sassi, O., Crassous, R., Gitz, V., Waisman, H., & Guivarch,C. (2010). IMACLIM-R: a modelling framework to simulate sustainable development pathways. International Journal of Global Environmental Issues, 10(1/2), 5-24.