

Vincent VIGUIÉ

French Nationality, Date of birth: 01/01/1983

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Research Interests

Climate change adaptation economics: Evaluation of climate policies, Climate change impacts and vulnerabilities, natural disasters indirect economic impacts

Sustainable city development: Climate Policy implications on/from urban areas, Synergies and conflicts between urban climate policies and other urban policies

Modelling and methodologies: Modelling of coupled human/natural/engineering systems, Urban structure dynamics, future studies and long-term scenarios

Professional Experience

Since 2012	International Research Center on Environment and Development (CIRED) Research scientist	Paris, France
Since 2006	French Ministry of Ecology, Energy and Sustainable Development (MEEDDE) Executive top civil servant, at the Corps des Ponts et Chaussées	Paris, France
2008-2012	International Research Center on Environment and Development (CIRED) PhD candidate	Paris, France
Oct 2007-Sep 2008	The World Bank – Africa Transport Unit Analyst	Washington, USA West Africa

Education

2008-2011	International Research Center on Environment and Development (CIRED) PhD in Economics " <i>Urban dynamics modelling: towards an application for the economic assessment of climate change</i> " - Directors: Stéphane HALLEGATTE and Jean-Charles HOURCADE	Paris, France
2006-2008	Ecole Nationale des Ponts et Chaussées, Paritech - Master of engineering Major: Economics and finance Minor: Urbanism, Transport and environment	Paris, France
2002-2006	Studies in Physics at the Ecole Normale Supérieure, Lyon one of the best French selective "grande école" Degrees: <ul style="list-style-type: none">• Master of Science in Theoretical Physics in 2006, cum Laude• Physics « Agrégation » (prestigious competitive teaching examination) in 2005• Erasmus exchange student at Imperial College, London in 2004	Lyon, France London, UK

Publications

- Hamel, P., Guerry, A.D., Polasky, S., Han, B., Douglass, J.A., Hamann, M., Janke, B., Kuiper, J.J., Levrel, H., Liu, H., Lonsdorf, E., McDonald, R.I., Nootenboom, C., Ouyang, Z., Remme, R.P., Sharp, R.P., Tardieu, L., Viguié, V., Xu, D., Zheng, H., Daily, G.C., 2021. Mapping the benefits of nature in cities with the InVEST software. *npj Urban Sustainability* 1, 1–9. <https://doi.org/10.1038/s42949-021-00027-9>
- Salvia, M., Olazabal, M., Fokaides, P.A., Tardieu, L., Simoes, S.G., Geneletti, D., De Gregorio Hurtado, S., Viguié, V., Spyridaki, N.-A., Pietrapertosa, F., Ioannou, B.I., Matosović, M., Flamos, A., Balzan, M.V., Feliu, E., Rižnar, K., Šel, N.B., Heidrich, O., Reckien, D., 2021a. Climate mitigation in the Mediterranean Europe: An assessment of regional and city-level plans. *Journal of Environmental Management* 295, 113146. <https://doi.org/10.1016/j.jenvman.2021.113146>
- Salvia, M., Reckien, D., Pietrapertosa, F., Eckersley, P., Spyridaki, N.-A., Krook-Riekkola, A., Olazabal, M., De Gregorio Hurtado, S., Simoes, S.G., Geneletti, D., Viguié, V., Fokaides, P.A., Ioannou, B.I., Flamos, A., Csete, M.S., Buzasi, A., Orru, H., de Boer, C., Foley, A., Rižnar, K., Matosović, M., Balzan, M.V., Smigaj, M., Baštáková, V., Streberova, E., Šel, N.B., Coste, L., Tardieu, L., Altenburg, C., Lorencová, E.K., Orru, K., Wejs, A., Feliu, E., Church, J.M., Grafakos, S., Vasilie, S., Paspaldzhiev, I., Heidrich, O., 2021b. Will climate mitigation ambitions lead to carbon neutrality? An analysis of the local-level plans of 327 cities in the EU. *Renewable and Sustainable Energy Reviews* 135, 110253. <https://doi.org/10.1016/j.rser.2020.110253>
- Sudmant, A., Viguié, V., Lepetit, Q., Oates, L., Datey, A., Gouldson, A., Watling, D., 2021. Fair weather forecasting? The shortcomings of big data for sustainable development, a case study from Hubballi-Dharwad, India. *Sustainable Development* n/a. <https://doi.org/10.1002/sd.2221>
- Tardieu, L., Hamel, P., Viguié, V., Coste, L., Levrel, H., 2021. Are soil sealing indicators sufficient to guide urban planning? Insights from an ES assessment in the Paris metropolitan area. *Environmental Research Letters* <https://doi.org/10.1088/1748-9326/ac24d0>
- Viguié, V., Juhel, S., Ben-Ari, T., Colombert, M., Ford, J.D., Giraudet, L.G., Reckien, D., 2021. When adaptation increases energy demand: A systematic map of the literature. *Environmental Research Letters* 16, 033004. <https://doi.org/10.1088/1748-9326/abc044>
- Creutzig, Felix, Xuemei Bai, Radhika Khosla, Vincent Viguié, and Yoshiki Yamagata. 2020. "Systematizing and Upscaling Urban Climate Change Mitigation." *Environmental Research Letters* 15 (10): 100202. .
- Avner, P., Viguié, V., Jafino, B.A., Hallegatte, S., 2021. Flood Protection and Land Value Creation - Not All Resilience Investments Are Created Equal (**World Bank Policy Research Working Paper** No. WPS 9744). The World Bank, Washington, D.C.
- Grafakos, S., Viero, G., Reckien, D., Trigg, K., Viguié, V., Sudmant, A., Graves, C., Foley, A., Heidrich, O., Miralles, J. M., Carter, J., Chang, L. H., Nador, C., Liseri, M., Chelleri, L., Orru, H., Orru, K., Aelenei, R., Bilska, A., ... Dawson, R. (2020). Integration of mitigation and adaptation in urban climate change action plans in Europe: A systematic assessment. *Renewable and Sustainable Energy Reviews*, 121, 109623. <https://doi.org/10.1016/j.rser.2019.109623>
- Viguié, V., Lemonsu, A., Hallegatte, S., Beaulant, A.-L., Marchadier, C., Masson, V., Pigeon, G., & Salagnac, J.-L. (2020). Early adaptation to heat waves and future reduction of air-conditioning energy use in Paris. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ab6a24>
- Pfeiffer, B. F., Rabe, C., Selod, H., & Viguié, V. (2019). Assessing Urban Policies Using a Simulation Model with Formal and Informal Housing: Application to Cape Town, South Africa (No. WPS8921; pp. 1–44). **World Bank Working papers**.
- Coulombel, N., Boutueil, V., Liu, L., Viguié, V., Yin, B., 2019. Substantial rebound effects in urban ridesharing: Simulating travel decisions in Paris, France. *Transportation Research Part D: Transport and Environment*, 71, 110–126.
- Mi, Z., Guan, D., Liu, Z., Liu, J., Viguié, V., Fromer, N., Wang, Y., 2019. Cities: The core of climate change mitigation. *Journal of Cleaner Production* 207, 582–589.
- Yin, B., Liu, L., Coulombel, N., Viguié, V., 2018. Appraising the environmental benefits of ride-sharing: The Paris region case study. *Journal of Cleaner Production* 177, 888–898.
- M Daniel, A Lemonsu, V Viguié. 2018. "Role of watering practices in large-scale urban planning strategies to face the heat-wave risk in future climate" *Urban Climate*, 23, 287-308
- B Yin, L Liu, N Coulombel, V Viguié 2017 « Evaluation of ridesharing impacts using an integrated transport land-use model: a case study for the Paris region » *Transportation Research Procedia* 27, 824-831
- P Avner, SR Mehndiratta, V Viguié, S Hallegatte 2017 « Buses, houses or cash? socio-economic, spatial and environmental consequences of reforming public transport subsidies in Buenos Aires » **World Bank Working papers**
- Thierry Brunelle, Mathilde Coat, and Vincent Viguié. 2017 "Demand-side mitigation options of the agricultural sector: potential, barriers and ways forward" *Oil- and protein-crops and climate change* 24,1
- Julie Prud'homme ; Isabelle Coll ; Arthur Elessa-Etuman ; Vincent Viguié ; Nicolas Coulombel. 2017. Coupling spatialized models to evaluate the effects of urban densification on air quality in the Paris metropolitan area. *International Journal of Spatial, Temporal and Multimedia Information Systems*.
- T Houet, C Marchadier, G Bretagne, MP Moine, R Aguejedad, V Viguié et al. 2016. "Combining narratives and modelling approaches to simulate fine scale and long-term urban growth scenarios for climate adaptation" *Environmental Modelling & Software* 86, 1-13
- R. Aguejedad, O Doukari, T Houet, P Avner, V Viguié. 2016. "Etalement urbain et géoprospective: apports et limites des modèles de spatialisation. Application aux modèles SLEUTH, LCM et NEDUM-2D". *Cybergeo: European Journal of Geography*
- A Lemonsu, V Viguié, M Daniel, V Masson. 2015. "Vulnerability to heat waves: Impact of urban expansion scenarios on urban heat island and heat stress in Paris (France)" *Urban Climate* 14, 586-605
- Martin, Eric, David Salas y Méliá, Vincent Badeau, Christine Delire, Jean-Pierre Gattuso, Aude Lemonsu, Valéry Masson, Grégoire Pigeon, Mathieu Regimbeau, et Vincent Viguié. 2015. « Impacts, adaptation et vulnérabilité des systèmes naturels et humains en Europe ». *La Météorologie*, n°88.
- Despoues et al. « Les territoires en route pour la COP 21. Les notions indispensables sur les impacts du changement climatique, les politiques climatiques et les outils économiques » publication conjointe de la CDC Climat Recherche, Météo France, l'ONERC, avec le soutien de l'AFD et l'ADEME
- Viguié, Vincent, Stéphane Hallegatte, 2014 "Urban infrastructure investment and rent-capture potentials". **World Bank Working papers**
- Masson, V., C. Marchadier, L. Adolphe, R. Aguejedad, P. Avner, M. Bonhomme, G. Bretagne, et al. 2014. "Adapting Cities to Climate Change : A Systemic Modelling Approach." *Urban Climate* 10: 407-29.
- Viguié, Vincent, Stéphane Hallegatte, and Julie Rozenberg. 2014. "Downscaling Long Term Socio-Economic Scenarios at City Scale: A Case Study on Paris." *Technological Forecasting and Social Change*.

Köhler, Ristimäki, Viguié, Felieu et al., chapter "A review and analysis of quantitative integrated environmental assessment methods for urban areas" in the book coordinated by Dawson et al. 2014. "Understanding Cities : Advances in Integrated Assessment of Urban Sustainability". Centre For Earth Systems Engineering Research.

Viguié and Touzard. 2014 "Viticulture and adaptation to climate change" **Journal International des Sciences de la Vigne et du Vin**

Viguié and Hallegatte. 2013. "Les territoires français face au défi climatique : atténuation et adaptation." In Vers l'égalité des territoires, **rapport de la mission de réflexion pour la ministre de l'Égalité des territoires et du Logement**.

Avner, Viguié and Hallegatte. 2013 "Modélisation de l'effet d'une taxe sur la construction : le Versement pour Sous Densité". **Débats et politiques, revue de l'OFCE**, n°128.

Hallegatte et al. 2012 "Cities vulnerability to future heat waves & adaptation strategies", VURCA project final report

Viguié and Hallegatte. 2012. Trade-offs and Synergies in Urban Climate Policies. **Nature Climate Change** 2 (3)

Viguié and Hallegatte. 2010. Une taxe carbone peut-elle rendre l'agglomération parisienne plus dense ? In Economie et développement urbain durable. **Presses de l'École des mines**.

Viguié, and Hallegatte. 2010. Les villes aujourd'hui, quelle vulnérabilité au changement climatique ? In Villes et adaptation au changement climatique. **Rapport de l'ONERC au premier ministre et au parlement**. (translated as: How vulnerable are cities to climate change? In Cities and adapting to climate change. ONERC Report to the French Prime Minister and Parliament.)

Projects

<i>Administrative responsibilities</i>	Elected deputy board member of Ecole des Ponts ParisTech Member of the Energy/climate expertise appraisal committee of the French ministry of environment.
<i>Management</i>	Head of the sustainable urban development team in CIRED (in 2019: 4 engineers, 1 PhD student, 1 part-time post-doc). Co-Coordinator of the VURCA (3 years, 3 institutes) ANR project Coordinator of CIRED's participation to MUSCADE (ANR), Acclimat (RTRA-STAE), DRAGON (ANR), VITE (ANR) POLL-EXPO (Ademe) research projects, and CIRED's participation to French National Observatory on Climate Change Impacts (ONERC) annual report to the French Prime Minister and Parliament.
<i>PhD supervision</i>	Participation to Basile Pfeiffer, Joël Hamman, Paolo Avner, Samuel Juhel and Charlotte Liotta PhD supervision.
<i>Expertise</i>	Member of several academic networks and associations, including the Urban Climate Change Research Network (UCCRN) and of the Euro-LCP Research Network. Member of the scientific council of the Groupement Régional des Experts sur le Climat d'île de France (GREC Île de France). Participation in the organization of the 1 st French National adaptation plan and in the expert committees of the 2 nd National adaptation plan. Consulting for WWF, Negawatt network, GRET ... Contributed to the drafting of FFEM (French Global Environment Facility) adaptation financing strategy Participation in the study of climate change impacts and adaptation options for various regions (South East of France, coordinated by Provence-Alpes-Côte d'Azur prefecture, Seine Saint Denis Department, and Wallonie Region in Belgium). Collaboration and expertise about sustainable city development or climate change adaptation with World Bank, OECD, European Environment Agency, French Global Environment Facility (FFEM), I4CE, French Ministry of sustainable development, ONERC (French government's observatory for climate change impacts and adaptation), Paris city administration, Ile de France Urbanism Institute (IAU), Grand Lyon urbanism institute (UrbaLyon), Toulouse Urbanism Institute (AUAT), Ademe (French agency for Energy and environment), Allianz, Centre Interprofessionnel du Vin de Bordeaux, Groupe Vinci...
<i>Teaching</i>	Courses on climate change adaptation and sustainable city development – master level – engineering schools : Ponts ParisTech, Sciences Po, Ecole Nationale de la Météorologie, AgroParisTech, Ecole Polytechnique, ENSTA, Ecole Supérieure de Commerce de Toulouse
<i>Outreach</i>	Interviews and outreach texts in journals and newspapers (Le Monde, Time Magazine, Libération, France Inter, La Croix, AFP, France 3, Europe 1, Sciences et Avenir...)
<i>Prize</i>	PhD Student Paper Prize (2nd ex-aequo) in energy economics, French Association for Energy Economics (December, 12th 2011)

Vulgarization/Communication with decision-makers

Member of the scientific council of the Office for Climate Education from 2017 to 2020.

Participation to the train of climate, which travels across France with researchers on board to inform people about climate change issues (EMS Outreach & Communication Award 2017).

Conferences at the French academy of sciences (latest: January 2020), OECD (latest: February 2017), World Bank (latest: November 2014), AFD (latest: October 2015), French ministry of environment (latest: September 2016), Collège de France (latest: June 2013), French ministry of economics and finance (latest: January 2018), various local authorities (latest: Direction régionale et interdépartementale de l'environnement, de l'aménagement et des transports Île de France, October 2021, Conseil Régional de la région Occitanie, Octobre 2019)

Research projects

POLL-EXPO (2019-...) Air pollution, transport and land planning in Île de France Region.

IDEFESE (2017-2020) Services écosystémiques en île de France et impacts du changement climatique / Ecosystem services and climate change impacts in Paris Region

Transport Policies for Sustainable and Inclusive Growth (2016-2019) World Bank Strategic Research Program. Lead : Harris Selod.

DRAGON (2015-2020) aims to develop robust evidence on the scope for, the routes to and the potential limits of green growth strategies in both EU and Chinese cities, and to draw lessons and promote learning to facilitate a transition towards low carbon development in EU and Chinese cities

VITE (2014-2020) aims to bring a prospective approach to social, environmental, and territorial effects of urban energy transition strategies. Taking Paris urban area as a case study, the project will examine existing scenarios developed during regional strategic planning and will explore direct and indirect effects of proposed strategies in terms of resource, energy, pollution and pollution fluxes.

VURCA (2009-2012) research project studies **Paris urban area** vulnerability to future heat-waves, in order to provide first insights on the complex interaction between city economies and climate change and on the viability and effectiveness of identified adaptation options.

MUSCADE (2010-2014) project focuses on three items involved into **Paris urban area** sustainable development: energy, city structure, and climate change, closely linked to each other's, at both global and local scales. This project is intended to open new interdisciplinary research areas on sustainable cities and to increase urban planners awareness on energy issues within the city, given the climate change. By identifying leverages, the framework could also help future decisions concerning buildings, local energy production, and urban regulations.

ACCLIMAT (2010-2013) research project aims to study urban development, urban micro-climate, and climate change process interactions in **Toulouse**. A numerical modelling framework will be developed to couple physical models and socio-economics urban models, which will be driven by local climate change and socio-economic scenarios, including macro-economics, land-use, building materials, technologic and transportation assumptions.

European COST Action TU0902 (2009-2014) Integrated assessment technologies to support the sustainable development of urban areas.

Other information

Language skills **French:** Mother tongue
English: Fluent
Gersman: Conversant
Spanish: Basic Level

Computer knowledge **Programming and Scientific calculus:** Python (including TensorFlow), R, Matlab
GIS: QGis, GIS with Python and R
Linux, Windows, LaTeX, MS Office

Sports and Hobbies **Sport:** Rock climbing, kitesurfing, sailing, diving, French boxing, skydiving
I have been volunteering for seven years in the social support and the first responder services of the **French Red Cross**, and was during 5 years a member of the executive board of one of its Paris district divisions.