

Emmanuel Bozonnet

Associate professor – University of la Rochelle, France



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Short Brief

Associate professor in La Rochelle University since 2006, Emmanuel Bozonnet conducts his research in building physics and teaches in the civil engineering department. Specialized in building energy (agrégation teaching qualification in 2000), he studied building interactions with urban microclimate during his PhD (2005) and afterward, from urban canyon to district scale. This modeling work has been corroborated by various scale experiments from the building envelope component to the development of a reduced scale mockup for urban canyons and in situ buildings. These studies focus on the development of cooling strategies for the mitigation of building energy demand and urban heat islands. He investigated urban and building surface modifications (cool or green coating) through his involvements in various national and European research projects. His research on building energy performance includes also the question of building information modeling and interoperability to develop new design tools and methodologies including cosimulation and building envelope optimization.

Involved in various scientific conference committees and project management, he participates also to the board of IBPSA France (International Building Performance Simulation Association) and the board of the ECRC (European Cool Roof Council). He is also co-leader of the group on urban microclimate and energy in the research federationIRSTV (Institute for Research on Urban Sciences and Techniques, France).

Curriculum Vitae – Emmanuel Bozonnet

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AGRÉGATION¹ OF BUILDING ENERGY

EDUCATION

2005 Ph.D. of civil engineering – University of la Rochelle
2001 M.S. of civil engineering – University of la Rochelle
2000 Agrégation of building energy civil engineering – École Normale Supérieure (ENS Cachan)

EMPLOYMENTS

Sept 2006 – Present **Associate professor** / University of La Rochelle
2004 – 2006 **Research and teacher assistant** / University of La Rochelle
2001 – 2004 **Lecturer** / University of La Rochelle
Feb 1999 – Aug 1999 **CAD Teacher** / Public high school (Reunion island)
Sept 1997 – Jan 1999 **Engineer** in renewable energy and building EP / French national agency for the environment and energy management (ADEME, Reunion island)

ACADEMIC & OTHER

FUNCTIONS

Since 2012 co-leader of the group on urban microclimate and energy in the research federation IRSTV (Institute for Research on Urban Sciences and Techniques, France)
Since 2012 Technical committee member for the European standard CEN/TC 254/WG 16 roof reflectivity
Since 2011 Board member of the ECRC (European Cool Roof Council)
2011 - 2014 Head of professional bachelor in HVAC (University of la Rochelle)
Since 2008 Board member of IBPSA France (International Building Performance Simulation Association)

PHD AND POSTDOC SUPERVISION

5 PhD thesis (1 ongoing), 8 post doctorates (3 ongoing)

INTERNATIONAL AND NATIONAL RESEARCH PROJECTS

International projects: MED-MAIN (2015, subcontracting), REPUBLIC-MED (2014-2015, subcontracting), COOLROOFS (2008-2011), EEED (2005-2007)

National projects: VENISE (2012-2017), ICU (2013), PROGEMI (2011-2015), VegDUD (2010-2014), SOPREMA (2010-2012), ClifUrbain-MeigeVille (2007-2009), DynaSimul (2007-2010), URBAT (2005-2007)

¹ "Agrégation" is a competitive examination for professors in secondary education in France

SOME EDUCATIONAL ACTIVITIES

Lectures at University of la Rochelle (260 h/yr) for bachelor and master degrees: civil engineering introduction, topography, hydraulic networks, building energy simulation, building refurbishment projects.

Lectures on UHI and cool materials for master degree in ENTPE (Lyon, France) 14h/yr (since 2012) and 16h (2011) in Reunion Island University.

Lecture for IABP PhD summer school (Turin, Italy, 2015) on UHI and energy demand.

Member of the national jury for high school technical teachers in HVAC (2007-2012).

INTERNATIONAL AND BOOK PUBLICATIONS

<https://www.zotero.org/ebozonne/cv>

International journal articles

- [1]. Djedjig, R., Bozonnet, E., & Belarbi, R. (2016). Modeling green wall interactions with street canyons for building energy simulation in urban context. *Urban Climate*, in Press. <http://doi.org/10.1016/j.uclim.2015.12.003>
- [2]. Djedjig, R., Bozonnet, E., & Belarbi, R. (2015a). Analysis of thermal effects of vegetated envelopes: Integration of a validated model in a building energy simulation program. *Energy and Buildings*, 86, 93–103. <http://doi.org/10.1016/j.enbuild.2014.09.057>
- [3]. Djedjig, R., Bozonnet, E., & Belarbi, R. (2015b). Experimental study of the urban microclimate mitigation potential of green roofs and green walls in street canyons. *International Journal of Low-Carbon Technologies*, 10(1), 34–44. <http://doi.org/10.1093/ijlct/ctt019>
- [4]. Bozonnet, E., Musy, M., Calmet, I., & Rodriguez, F. (2015). Modeling methods to assess urban fluxes and heat island mitigation measures from street to city scale. *International Journal of Low-Carbon Technologies*, 10(1), 62–77. <http://doi.org/10.1093/ijlct/ctt049>
- [5]. Gros, A., Bozonnet, E., Inard, C., & Musy, M. (2015). Simulation tools to assess microclimate and building energy – A case study on the design of a new district. *Energy and Buildings*, In Press. <http://doi.org/10.1016/j.enbuild.2015.06.032>
- [6]. Dhalluin, A., & Bozonnet, E. (2015). Urban heat islands and sensitive building design – a study in some French cities' context. *Sustainable Cities and Society*, In Press. <http://doi.org/10.1016/j.scs.2015.06.009>
- [7]. Gros, A., Bozonnet, E., & Inard, C. (2014). Cool materials impact at district scale - Coupling building energy and microclimate models. *Sustainable Cities and Society*, 13, 254–266. <http://doi.org/10.1016/j.scs.2014.02.002>
- [8]. Lapisia, R., Bozonnet, E., Abadie, M. O., & Salagnac, P. (2013). Cool roof and ventilation efficiency as passive cooling strategies for commercial low-rise buildings – ground thermal inertia impact. *Advances in Building Energy Research*, 7(2), 192–208. <http://doi.org/10.1080/17512549.2013.865559>
- [9]. Djedjig, R., Ouldboukhitine, S.-E., Belarbi, R., & Bozonnet, E. (2012). Development and validation of a coupled heat and mass transfer model for green roofs. *International Communications in Heat and Mass Transfer*, 39(6), 752–761. <http://doi.org/10.1016/j.icheatmasstransfer.2012.03.024>
- [10]. Doya, M., Bozonnet, E., & Allard, F. (2012). Experimental measurement of cool facades' performance in a dense urban environment. *Energy and Buildings*, 55, 42–50. <http://doi.org/10.1016/j.enbuild.2011.11.001>
- [11]. Jaffal, I., Inard, C., & Bozonnet, E. (2012). Toward integrated building design: A parametric method for evaluating heating demand. *Applied Thermal Engineering*, 40, 267–274. <http://doi.org/10.1016/j.applthermaleng.2012.02.005>
- [12]. Bozonnet, E., Doya, M., & Allard, F. (2011). Cool roofs impact on building thermal response: A French case study. *Energy and Buildings*, 43(11), 3006–3012. <http://doi.org/10.1016/j.enbuild.2011.07.017>
- [13]. Gros, A., Bozonnet, E., & Inard, C. (2011). Modelling the Radiative Exchanges in Urban Areas: A Review. *Advances in Building Energy Research*, 5(1), 163–206. <http://doi.org/10.1080/17512549.2011.582353>
- [14]. Bozonnet, E., Belarbi, R., & Allard, F. (2007). Thermal Behaviour of buildings: modelling the impact of urban heat island. *Journal of Harbin Institute of Technology (New Series)*, 14(Sup.), 19–22. Retrieved from <http://www.scopus.com/record/display.url?eid=2-s2.0-33947141518&origin=inward>
- [15]. Bozonnet, E., Belarbi, R., & Allard, F. (2005). Modelling solar effects on the heat and mass transfer in a street canyon, a simplified approach. *Solar Energy*, 79(1), 10–24. <http://doi.org/10.1016/j.solener.2004.10.007>

Book chapters

- [16]. Brangeon, B., & Bozonnet, E. (2016). Mise en oeuvre de la simulation - Géométrie, liens avec la maquette numérique. In B. Peuportier (Ed.), *Énergétique des bâtiments et simulation thermique* (Eyrolles, pp. 256–270). Paris, France. Retrieved from <http://www.eyrolles.com/BTP/Livre/energetique-des-batiments-simulation-thermique-9782212142754>
- [17]. Musy, M., & Bozonnet, E. (2016). Mise en oeuvre de la simulation - Microclimat et environnement proche. In B. Peuportier (Ed.), *Énergétique des bâtiments et simulation thermique* (Eyrolles, pp. 240–256). Paris, France. Retrieved from <http://www.eyrolles.com/BTP/Livre/energetique-des-batiments-simulation-thermique-9782212142754>
- [18]. Salagnac, P., Lapisia, R., Abadie, M. O., & Bozonnet, E. (2016). Nouvelles utilisations de la simulation - Bâtiment industriel et tertiaire. In B. Peuportier (Ed.), *Énergétique des bâtiments et simulation thermique* (Eyrolles, pp. 415–424). Paris, France. Retrieved from <http://www.eyrolles.com/BTP/Livre/energetique-des-batiments-simulation-thermique-9782212142754>
- [19]. Bozonnet, E., Belarbi, R., Djedjig, R., Gros, A., Malys, L., Inard, C., & Musy, M. (2014). Impacts sur la consommation énergétique et le confort dans les bâtiments. In M. Musy (Ed.), *Une ville verte-Les rôles du végétal en ville* (pp. 67–84). Quae éditions. Retrieved from <http://www.quae.com/fr/r3400-une-ville-verte.html>

- [20]. Zinzi, M., & Bozonnet, E. (2013). Cool Roofs' Case Studies. In D. Kolokotsa, M. Santamouris, & H. Akbari (Eds.), *Advances in the Development of Cool Materials for the Built Environment* (Bentham Science Publishers, pp. 333–381). Retrieved from <http://www.eurekaselect.com/107422/chapter/cool-roofs%E2%80%99-case-studie>
- [21]. Musy, M., & Bozonnet, E. (2013). Micro-climats et interactions avec le bâtiment. In B. Peuportier (Ed.), *Livre blanc sur les recherches en énergétique des bâtiments* (p. 39). Paris (France): Presses des MINES. Retrieved from <http://www.pressesdesmines.com/developpement-durable/livre-blanc-sur-les-recherches-en-energetique-des-batiments.html>
- [22]. Bozonnet, E., Allard, F., Chazelas, M., Guarracino, G., & Musy, M. (2008). Du bâtiment à la ville, du microclimat à la demande énergétique. In J. Fol (Ed.), *Futur de l'habitat* (pp. 139–154). Jean-Michel Place / PUCA.

Magazines and other journals

- [23]. Bozonnet, E., Djedjig, R., & Belarbi, R. (2014). Apports de la végétalisation à l'échelle des bâtiments et des quartiers : aspects thermiques. *Jardins de France*, (629), 15–17. Retrieved from <http://www.jardinsdefrance.org/la-collection/629-murs-toitures-verdure/aspects-thermiques>
- [24]. Bozonnet, E., Belarbi, R., & Allard, F. (2006). Etude de la demande énergétique de climatisation pour une construction urbaine de type méditerranéenne. *Tecnologia Y Construccion*, 22(3), p.27–34. ISSN 0798–9601. Retrieved from http://www2.scielo.org/ve/scielo.php?script=sci_arttext&pid=S0798-96012006000300003
- [25]. Bozonnet, E., & Allard, F. (2006). The Implementation of the Energy Performance Directive Throughout Europe - A review of the vocational training need for the EPBD throughout Europe. *Rehva Journal*, 6–11. Retrieved from <http://hal.archives-ouvertes.fr/hal-00312180/en/>

International conference articles

- [26]. Gros, A., Bozonnet, E., Inard, C., Musy, M., & Calmet, I. (2015). Assessment of urban cooling strategies impact using a coupled model for urban microclimate and building energy simulation. Presented at the ICUC9 - 9th International Conference on Urban Climate, Toulouse (France).
- [27]. Chardon, S., Brangeon, B., Bozonnet, E., Inard, C., & Montecot, R. (2015). A multi objective design tool for the french detached house market: cost and energy performance optimization. In *14th International Building Simulation Conference*. Hyderabad, India.
- [28]. Djedjig, R., Bozonnet, E., & Belarbi, R. (2014). A hygrothermal model of green walls interactions in street canyons – numerical development and experimental comparison. In A. Muscio (Ed.), *Proceedings of the third international conference on countermeasures to urban heat island* (pp. 1540–1551). Venice, Italy. Retrieved from <http://www.ic2uhi.unimore.it>
- [29]. Chardon, S., Bozonnet, E., Montecot, R., & Inard, C. (2014). A new tool for designing cost effective low energy houses in France. In L. Malki-Epstein, C. Spataru, L. Marjanovic-Halburd, & D. Mumovic (Eds.), *Proceedings of the 2014 Building Simulation and Optimization Conference*. UCL, London, UK. Retrieved from http://www.bso14.org/BSO14_Papers/BSO14_Paper_017.pdf
- [30]. Gros, A., Bozonnet, E., Inard, C., & Musy, M. (2014). Case study of a new district design through a coupled model for urban microclimate and building energy simulation. In A. Muscio (Ed.), *Proceedings of the third international conference on countermeasures to urban heat island* (pp. 1552–1563). Venice, Italy. Retrieved from <http://www.ic2uhi.unimore.it>
- [31]. Dhalluin, A., & Bozonnet, E. (2014). How UHI is taken into account in the location and the design of public buildings for sensitive people to rising temperature. In A. Muscio (Ed.), *Proceedings of the third international conference on countermeasures to urban heat island* (pp. 876–887). Venice, Italy. Retrieved from <http://www.ic2uhi.unimore.it>
- [32]. Musy, M., Malys, L., Morille, B., Szucs, A., Inard, C., Bozonnet, E., ... Chancibault, K. (2014). Impact of vegetation on urban climate, thermal comfort and building energy consumption – Overview of VegDUD project results. In A. Muscio (Ed.), *Proceedings of the third international conference on countermeasures to urban heat island* (pp. 719–730). Venice, Italy. Retrieved from <http://www.ic2uhi.unimore.it>
- [33]. Lapisa, R., Abadie, M. O., Bozonnet, E., & Salagnac, P. (2014). Numerical analysis of the thermal stratification modelling effect on comfort for the case of a commercial low-rise building. In *Proceedings of Indoor Air 2014* (Vol. 4, pp. 310–317). Hong Kong. Retrieved from <http://www.scopus.com/inward/record.url?eid=2-s2.0-84924689946&partnerID=40&md5=c99f6b9d17c3671ee6e063261e79286f>
- [34]. Lapisa, R., Bozonnet, E., Abadie, M., Salagnac, P., & Perrin, R. (2013). Design impacts of cool roof coating, ventilation and thermal inertia on commercial low-rise building energy demand and summer comfort. In *Energy conservation technologies for mitigation and adaptation in the built environment: the role of ventilation strategies and smart materials* (pp. 1061–1070). Athens, Greece. Retrieved from <http://www.aivc.org/resource/design-impacts-cool-roof-coating-ventilation-and-thermal-inertia-commercial-low-rise>
- [35]. Lapisa, R., Bozonnet, E., Abadie, M., & Salagnac, P. (2013). Effect of ground thermal inertia on the energy balance of commercial low-rise buildings. In *Building simulation for a sustainable world* (pp. 2068–3825). Chambéry, France. Retrieved from http://www.ibpsa.org/proceedings/BS2013/p_1286.pdf
- [36]. Djedjig, R., Belarbi, R., & Bozonnet, E. (2013). Experimental Study of a Green Wall System Effects in Urban Canyon Scene. In *11th REHVA World Congress & 8th International Conference on IAQVEC* (pp. 442–451). Prague, Czech Republic.
- [37]. Gros, A., Alexaki, P., Bozonnet, E., & Inard, C. (2013). Influence of cool materials on building energy demand at district scale. In *Energy conservation technologies for mitigation and adaptation in the built environment: the role of ventilation strategies and smart materials* (pp. 1050–1060). Athens, Greece.
- [38]. Djedjig, R., Bozonnet, E., & Belarbi, R. (2013). Integration of a green envelope model in a transient building simulation program and experimental comparison. In *Building simulation for a sustainable world* (pp. 49–55). Chambéry, France. Retrieved from http://www.ibpsa.org/proceedings/BS2013/p_1225.pdf
- [39]. Synnefa, A., Pantazaras, A., Santamouris, M., Bozonnet, E., Doya, M., Zinzi, M., ... Kolokotsa, D. (2013). Interlaboratory comparison of cool roofing material measurement methods. In *Energy conservation technologies for mitigation and adaptation in the built environment: the role of ventilation strategies and smart materials*. Athens, Greece.
- [40]. Gros, A., Bozonnet, E., & Inard, C. (2012). Modelling the building energy demand at district scale. Presented at the 8th International Conference on Urban Climate - ICUC8, Dublin, Ireland.

- [41]. Trabelsi, A., Bozonnet, E., Salagnac, P., Belarbi, R., & Perrin, R. (2011). Roof design and skylights effects on the energy performance and comfort of low energy industrial buildings. Presented at the ISES Solar world congress 2011, Kassel, Germany.
- [42]. Doya, M., Bozonnet, E., & Allard, F. (2010a). Benefits of cool facades in dense urban environment. In *Cooling the Cities - The absolute Priority*. Rhodes Island, Greece.
- [43]. Doya, M., Bozonnet, E., & Allard, F. (2010b). Comparison of Building Energy Models Prognostics for Cool Façades' Performance in a Dense Urban Environment. In *CLIMA 2010*. Antalya, Turkey.
- [44]. Bozonnet, E., & Doya, M. (2010). Cool roofs impact on building thermal response - a French case study. In *Cooling the Cities - The absolute Priority*. Rhodes Island, Greece.
- [45]. Zinzi, M., Bozonnet, E., Kolokotroni, M., Kolokotsa, D., Santamouris, M., & Synnefa, A. (2010). Technical advances in the EU-Cool Roof project. Presented at the EuroSun 2010, Graz, Austria.
- [46]. Doya, M., Bozonnet, E., & Allard, F. (2009). Investigating changes in façades' energy balance according to coating optical properties. In *BUILDING SIMULATION 2009* (pp. 1753–1760). Glasgow, Scotland. Retrieved from http://ibpsa.org/proceedings/BS2009/BS09_1753_1760.pdf
- [47]. Denes, T., Bozonnet, E., & Calmet, I. (2009). Modeling the global warming effect on indoor temperature peaks and cooling systems consumption. In *BUILDING SIMULATION 2009* (p. 117). Glasgow, Scotland. Retrieved from http://ibpsa.org/proceedings/BS2009/BS09_0117_122.pdf
- [48]. Doya, M., Bozonnet, E., & Allard, F. (2007). Theoretical evaluation of energy performance achieved by cool paints for dense urban environment. In C. M. Joppolo (Ed.), *Proceedings of CLIMAMED 2007 - Energy, Climate and Indoor Comfort in Mediterranean Countries* (pp. 365–380). Genoa, Italy.
- [49]. Katsamaki, A., Kolokotsa, D., Saridakis, G., Geros, V., Santamouris, M., Bozonnet, E., ... Radulov, L. (2006). An interactive vocational training tool for the energy performance buildings directive. In *Technologies & sustainable policies for a radical decrease of the energy consumption in buildings* (pp. 20–22). Lyon, France. Retrieved from <http://www.aivc.org/resource/interactive-vocational-training-tool-energy-performance-buildings-directive?volume=34605>
- [50]. Bozonnet, E., Belarbi, R., & Allard, F. (2006a). Modelling air flows around buildings in urban environment. In *International Workshop on Energy Performance and Environmental Quality of Buildings* (p. 15). Milos island, Greece. Retrieved from http://www.inive.org/members_area/medias/pdf/Inive%5CMilos2006%5C04_Bozonnet_6P.pdf
- [51]. Bozonnet, E., Belarbi, R., & Allard, F. (2006b). Study of air conditioning energy demand for a Mediterranean urban construction - étude de la demande énergétique de climatisation pour une construction urbaine de type méditerranéenne. In *Proceedings of 3rd Mediterranean Congress of HVAC Engineering - Sustainable conditioning of indoor spaces* (pp. 247–255). Lyon, France: Francis Allard & Mirela Robitu. Retrieved from <http://hal.archives-ouvertes.fr/hal-00312386/en/>
- [52]. Bozonnet, E., Belarbi, R., & Allard, F. (2005). Modelling solar effects on the heat and mass transfer in a street canyon, a simplified approach. In *Réhabilitation des constructions et développement durable*. Alger, Algeria.
- [53]. Wurtz, E., Deque, F., Mora, L., Bozonnet, E., & Trompezinsky, S. (2003). Sim_zonal: a software to evaluate the risk of discomfort: coupling with an energy engine, comparison with cfd codes and experimental measurements. In *BUILDING SIMULATION 2003* (pp. 1423 – 1428). Eindhoven, Netherlands. Retrieved from http://www.ibpsa.org/proceedings/BS2003/BS03_1423_1428.pdf