

PERSONAL INFORMATION

Marco Perino



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Sex: male | Date of birth: 07/06/1963 | Nationality: Italian

WORK EXPERIENCE

From 1st October 2019 - until now

Head of the Department of Energy - Politecnico di Torino – Dipartimento Energia - DENERG - Torino – Italy

From 1st May 2019 to 1st June 2019

Princeton University - Andlinger Center for Energy and Environment – New Jersey – US - Visiting professor

From January 2005 - until now

Politecnico di Torino – Dipartimento Energia - DENERG – Torino – Italy - Full professor (SSD ING/IND11) – Applied (Building) Physics

From 1st November 1998 to 2004

1st Faculty of Architecture - Politecnico di Torino – Dipartimento di Energetica – DENER – Torino – Italy - Associate professor (SSD ING/IND11) – Applied (Building) Physics

From 1st April 2002 to 30th September 2002

Aalborg University - Department of Civil Engineering - Aalborg - Denmark - Visiting professor

From December 1992 to October 1997

2nd Faculty of Engineering – Vercelli - Politecnico di Torino – Dipartimento di Energetica – DENER – Italy - Researcher – Applied Physics (SSD I05)

From 1990 to 1991

Italian Military Navy - Corps of Naval Engineering, Military rank: Ensign, and then promoted to Sub-lieutenant - Navalgenarmi Torino – Italy - Reserve Officer (military service)

From 1989 to 1990

Politecnico di Torino – Dipartimento di Energetica – DENER – Torino – Italy - Grant Researcher

Business or sector: Higher Education (University professor/Researcher)

EDUCATION AND TRAINING

From 1989 to 1992

PhD in Energetics - V cycle - Dipartimento di Energetica del Politecnico di Torino – Italy

1989

Esame di Stato – Ordine degli Ingegneri della Provincia di Torino - II sessione del 1989 - Abilitazione alla professione di Ingegnere

From Oct. 1982 to July 1989

Corso di Laurea quinquennale in Ingegneria Meccanica (MSc in Mechanical Engineering) – Politecnico di Torino – Italy (score: 110/110 summa cum laudae)

From September 1977 to July 1982

IX Liceo Scientifico – Liceo Scientifico (Diploma di Maturità Scientifica) – Torino – Italy (score: 58/60)

PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

English (Reading/Speaking: very good. Writing: good)

Job-related skills

Marco Perino H-index: 25 (Scopus), 31 (Google Scholar, i10-index: 62)

Marco Perino's **scientific and research activities** have concerned the following themes:

- innovative building envelope components: the creation, thermo-fluid dynamic analysis and development of new concepts,
- super-insulating materials (VIP, Aerogels) and phase change materials (PCM) for building and air-conditioning systems,
- air-conditioning systems (HVAC) and ventilation systems, and their thermo-fluid dynamic analysis,
- Indoor environmental control for preventive conservation and the cultural heritage,

- personalised air-conditioning systems (Personal Comfort Devices – PCS) and air-conditioning systems for different means of transport (luxury yachts, cars, ...),
- measurement techniques for the experimental evaluation of the performances of ventilation and air-conditioning plants, building envelopes and energy systems,
- Thermal mass activation for the passive control of the internal temperature: analysis and optimisation,
- Demand Side Management, thermal storage in building/neighbourhood and application of MPC (Model Predictive Control) techniques,
- Indoor Air Quality and the dispersion of pollutants in confined and open environments,
- Low-power combustion heat generators and combustion analyses.

The results of these research activities were disseminated in more than 235 works of a scientific nature, and published in national/international journals, in national/international congress proceedings and in books. (Publication list: <https://iris.polito.it/cris/rp/rp05348#.YAm-5BbSl1l>).

He has a patent application (PCT) for “Apparato Elettrico E Metodo Per Il Controllo Adattativo Di Un Apparato Elettrico”, Rif. Glp - Gip's Ref. M6-6513, Air Conditioning, application N. Pct/It2021/050156, Data Deposito: 21/05/21, Titolare - De' Longhi Appliances & Politecnico Di Torino, Inventori: Perino Marco / Mirmiran Roshanak / Prosperi Francesca / Monticelli Enrica, Num. Domanda: It 10202000011809, Data Deposito: 21/05/20.

The experience gained in these sectors, and the numerous collaborations with research organisations and with national and foreign universities, have resulted in a consequent valorisation through the participation in work and research groups of:

- the International Energy Agency (IEA), as both an “expert member” and as a “sub-task leader” (1993 – 1996, Annex 26 - Energy efficient ventilation of large enclosures, as an expert member. 1998 – 2002, Annex 35 – “Control Strategies for Hybrid Ventilation in New and Retrofitted Office Buildings (HybVent)”. 2004 – 2009, Annex 44 – “Integrating Environmentally Responsive Elements in Buildings”, as coordinator of the “Responsive Building Elements” sub-task. 2012 – 2015, Annex 59 – “High Temperature Cooling and Low Temperature Heating in Buildings”, as co-chairman of the “Total system analysis” sub-task. 2014 – 2017, Annex 65 – “Long-Term Performance of Super-Insulating Materials in Building Components & Systems”).
- the World Health Organisation (WHO) (expert member of the “Hospital – Vent, Natural Ventilation in Infection Control in Health Care Settings” work group, set up in 2007 by the World Health Organisation (WHO) in order to draw up guidelines on the use of natural ventilation in hospitals for the control of infective diseases).
- revision committees of prestigious foreign research organisations

The reputation he has achieved at a national and international level is testified by the invitations he has received to participate in conferences and workshops, by the presidency of the International Association of Building Physics – IABP (2015-2018 mandate) and by the chairman role of the 6th International Building Physics Conference - IBPC, which was held in Turin in 2015. He was also Co-Chairman of the 15th International Conference – Roomvent 2020, organised in Torino, Politecnico di Torino from 14th to 17th February 2021.

Moreover, Marco Perino is/was also a member of more than 35 Scientific Committees of various International Conferences, a member of the Editorial committee of international scientific journals of reference in his scientific sector and reviewer for more than 20 of such journals (Member of the following Editorial Boards: “Building and Environment” from October 2015 to date, “International journal of Energy and Built Environment” from Augst 2019 to date, “Applied Science” – Energy Section from November 2020 to date. Guest Editor of the: Special Issue “Building Retrofit: Energy Conservation, Comfort and Sustainability” – Energy and Buildings, Elsevier, 2015-2016. Special Issue “From sustainable buildings to sustainable cities” – Sustainable Building and Society, Elsevier, 2015-2016. Special Issue “Façade 2018 – Adaptive!” – Journal of Façade Design & Engineering, TU Delfy Open, 2018. Proceedings of the COST Action TU 1403 “Adaptive Façades Network”, “Façade 2018 – Adaptive!” – Final Conference, TU Delfy Open, 26th - 27th November 2018, Luzern, Switzerland. Special Issue “Energy efficient envelope technologies for green, healthy and comfortable buildings” – Applied Sciences, 2020.)

He has also carried out the work of external reviewer for various national and international research organisations and publishing houses of worldwide importance.

Marco Perino was visiting professor at the: Aalborg University (AAU) Denmark, from the 1st of April 2002 to the 30th September 2002 (“Hybrid Ventilation Centre” – Department of “Building Technology and Structural engineering”), Pontificia Universidad Católica de Chile, from the 25th September to the 1st October 2017, Princeton University – USA, Andlinger Center for Energy and Environment, from the 29th April to the 31st May 2019.

He was member of:

- The International Advisory Board of the project: “4M: Measurement, Modelling, Mapping and Management (4M): An Evidence-Based Methodology for Understanding and Shrinking

the Urban Carbon Footprint" coordinated by prof. Kevin Loomas - Department of Civil and Building Engineering, Loughborough University (2.7 million Pounds).

- The external assessment committee for the accreditation of an international Master Course proposed by the University of Coimbra – Portugal (Master of Science in Sustainable Cities and Communities) - 2021.
- 6 Assessment Committees at the Aalborg University - Denmark, of which: 2 were for a position of "assistant professor" and 4 for a position of "associate professor".
- External reviewer for a position of professor at the Concordia University – Montreal – Canada and Wollongong University – Australia.
- External reviewer for a position of full professor at the Chalmers University – Goteborg, a position of full professor at the University of Wollongong – Australia.

Finally, he was involved in the appraisal for a track procedure for the Princeton University – US.

He was one of the 60 expert members invited to the Future Buildings Forum (FBF) "Think Tank Workshop - Transforming Cities in Hot and Humid Climates towards more Efficient and Sustainable Energy Use", organized in October 2017 by the International Energy Agency (IEA).

Marco Perino's research contracts and projects:

Marco Perino has been in charge of or has collaborated in numerous research and consultancy contracts with public organisations and private companies as well as in competitive research projects financed by public organisations and/or by European Commissions in the field of the research activities conducted by the Energy Department (previously Energetics Department) at the Politecnico di Torino.

In relation to the research and/or consultancy contracts, he has been the scientific responsible of more than 25 contracts and has taken part in about another 30 as a researcher. Overall, more than Euros 1'000'000 were involved in these activities. The themes dealt with the theoretical-experimental analyses of the propagation of gases and pollutants in confined spaces, the fluid-dynamics verification of evacuation systems for the discharge of fire fumes, the study, analysis and optimisation of ventilation systems, the analysis of the indoor air quality in residential and services buildings, air-conditioning and heating systems, thermohygrometric comfort analyses of the built environment, innovative control systems for air-conditioning systems through "black-box" models, the analysis, development and optimisation of innovative and high-performance components for transparent and opaque building envelopes, the analysis and development of envelope and plant engineering systems for the climatic control inside pleasure boats, the use of thermal imaging for the diagnoses of environmental control inside data centres, local air-conditioning systems and the experimental verification of the performances of radiant systems.

Over the 2005-2011 period, Marco Perino was the scientific responsible (local unit) of two PRIN (Progetti Rilevante Interesse Nazionale) projects and three projects financed by the Regione Piemonte (and was the overall coordinator of two of these projects) for the Energy Department. These projects focused on the theme of innovative building envelopes for improvements of the energetic efficiency of buildings, for the design and development of innovative solar systems and for the tuning of nano-structural linings with selective gas permeability (with emphasis on the measurement of the performances and on the possibility of applying such systems in museum environments).

He was also the scientific responsible (local unit) of the European Marie Curie Training Network "CityNet" project, concerning energy saving at a building scale, and the energy planning at an urban and neighbourhood scale. Moreover, he took part in some of the research activities of the European "PolyCity" Concerto programme project.

He was the scientific responsible, or vice- responsible, for DENERG in the following European projects:

- "IDES-EDU" - Intelligent Energy Europe, related to the development of a teaching programme on "the education and training for the integrated and energetically sustainable design of the built environment", aimed at creating professional figures specialised in this sector.
- "Ci-Nergy, Synergies between cities and sustainable energy systems" - ITN Marie Curie Project, aimed at developing the skills and instruments necessary for energy planning and for energy sustainability at a neighbourhood and urban scale, with the objective of maximising the exploitation of renewable energy sources in the cities of the future.
- "W'ALL IN ONE – WALL Insulation Novel Nanomaterial Efficient systems". European project - call H2020, aimed at the development and performance analysis, in a laboratory and in situ, of innovative materials for the realisation of high energy efficient opaque building envelopes (scientific co-responsible of the local unit).

Moreover, he was the Italian Management Committee Member of the European COST Action TU1403: "Adaptive Façades Network" project, aimed at "...harmonizing, sharing and disseminating technological knowledge on adaptive façades at a European level".

He is currently:

- the scientific responsible of the DENERG unit PRIN project - Bando 2017 "FLEXHEAT - The

energy FLEXibility of enhanced HEAT pumps for the next generation of sustainable buildings", which is aimed at reducing the carbon footprint of buildings due to air-conditioning, through an integrated approach between envelope technologies and innovative plant systems.

- The scientific co- responsible of the DENERG unit H2020 "POWERSKINPLUS - Highly advanced modular integration of insulation, energising and storage systems for non-residential buildings" project, which is aimed at the developing and performance analyses, in a laboratory and in situ, of innovative materials and solutions for the retrofitting of existing façades (double skin and curtain wall). The objective is to develop and integrate innovative technologies for the thermal insulation and the exploitation of RES (Renewable Energy Sources) at a building scale, utilising VIP, PCM (Phase Change Materials), flexible thin glass, perovskite-based PV cells and multifunctional nano-structural coatings.

Finally, he has participated in another 6 projects, funded by public organisations (ministries and/or the Regione Piemonte), as a collaborator and senior researcher.

Overall, the funds obtained for the Department through these activities amounts to more than Euros 2'200'000.

Marco Perino's **teaching activities:**

He has given lectures and practical lessons in degree courses, and in particular in Master degree and Bachelor degree courses in: Applied Physics, Environmental Applied Physics, Thermal plants (HVAC systems), Applied Thermodynamics, Environmental Control Models, Environmental Control Technologies, Thermodynamics and Fundamentals of Energetics, Acoustics and Lighting, Air-conditioning, The Integration of Technical Systems in Existing Buildings, Mechanical Systems, Technologies for Renewable Energy Sources, and The Thermo-physics of Buildings. He has been a supervisor, or joint supervisor, of more than 240 degree theses (five-year degrees, bachelor's degrees, master's degrees and doctorate degrees) discussed at the Engineering and Architecture Faculties at the Politecnico di Torino and at the Physics, Mathematics and Natural Sciences Faculty of the University of Turin.

Marco Perino has been member of the following PhD Boards: PhD program in Innovazione Tecnologica per l'Architettura ed il Disegno Industriale (ITAD) (Technological Innovation for Architecture and Design) – SCUODO (SCUola di Dottorato)- Politecnico di Torino (2003-2005), PhD program in Fisica Tecnica dell'Università di Genova (dal 2000 al 2003) (Joint PhD with University of Genova, Applied Physics), PhD program in Innovazione Tecnologica per l'Ambiente Costruito (ITAC) (Technological Innovation for Architecture and Built Environment) – SCUODO (SCUola di Dottorato) - Politecnico di Torino (2005 - 2011), PhD program in Energetica (Energy Technology)– SCUODO (SCUola di Dottorato)- Politecnico di Torino (from 2012 to date). He has been supervisor, or joint supervisor, of 16 PhD students, including two students in joint supervision with the Technical University of Istanbul (Turkey), one in joint supervision with Trondheim Technical University (NTNU) (Norway) and one in joint supervision with the Pontificia Universidad Católica de Chile (PUC) (Chile). Moreover, he was member of the boards for the final dissertation (PhD defence jury) in the following foreign universities: EPFL - École polytechnique fédérale de Lausanne – Svizzera, Department of Civil Engineering, Aalborg University – Denmark, Department of Heating, Ventilation and Dust Removal Technology , Silesian University of Technology – Gliwice – Poland, Ecole Doctorale: Mécanique, Energétique, Génie Civil Et Acoustique (MEGA) Spécialité: Génie Civil, L'institut National Des Sciences Appliquées De Lyon – France, Technical University of Denmark - DTU - International Centre for Indoor Environment and Energy Department of Civil Engineering, Université de Lyon, École Nationale des Travaux Publics de l'État – ENTPE, Technical University Eindhoven – Technische Universiteit Eindhoven, Tu/e – The Netherlands, Concordia University, Montreal, Canada, TU Wien - Technische Universität Wien, Austria, TU Delft, The Netherlands.

He was external reviewer for the PhD dissertation of Mr. Jerko Labus - University Rovira I Virgili - Tarragona (Spain).

Digital skills

Excellent knowledge of the Microsoft Office (Word, Excel, PowerPoint) environment, Good ability in programming in Visual Basic (Microsoft), MATLAB/SIMULINK and Arduino environments.
Good knowledge of the FLUENT software for CFD simulation (Computational Fluid Dynamics).