

## PERSONAL INFORMATION Valerio Cozzani

**POSITION** Professor of Chemical Engineering, University of Bologna  
Director, Department of Civil, Chemical, Environmental and Materials Engineering  
Head of the Laboratory on Industrial Safety and Environmental Sustainability

## WORK EXPERIENCE

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|----------------|--|
| 2006 - present | <b>Professor</b><br>University of Bologna, Bologna, Italy <ul style="list-style-type: none"><li>▪ Research and Teaching</li></ul>  |
| 2002 - 2006    | <b>Associate Professor</b><br>University of Bologna, Bologna, Italy <ul style="list-style-type: none"><li>▪ Research and Teaching</li></ul>  |
| 1998 - 2002    | <b>Lecturer</b><br>University of Pisa, Pisa, Italy <ul style="list-style-type: none"><li>▪ Research and Teaching</li></ul>   |
| 1997 - 1998    | <b>Research Assistant</b><br>National Research Unit on Chemical and Environmental Risk – National Council of Research (CNR), Pisa, Italy <ul style="list-style-type: none"><li>▪ Research and Assistance in project assessment</li></ul> |
| 1995 - 1996    | <b>Visiting Fellow</b><br>Major Accident Hazards Bureau – EC Joint Research Centre – Ispra, Italy <ul style="list-style-type: none"><li>▪ Research</li></ul>   |

## EDUCATION AND TRAINING

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|-------------|---|
| 1993 - 1997 | <b>Ph.D. in Chemical Engineering</b><br>University of Pisa, Italy   |
| 1986 - 1992 | <b>B. Sc + M.Sc (Laurea quinquennale v.o.) in Chemical Engineering</b><br>Honors, University of Pisa, Italy |

## WORK ACTIVITIES

### Teaching experience

#### Overview of Teaching Experience

Valerio Cozzani has a wide experience in teaching, development of courses and design of academic and professional programs. He carried out several graduate and undergraduate teaching activities in B.Sc. and M.Sc. Programs in Chemical Engineering, Environmental Engineering, Safety Engineering and Energy Engineering at the Universities of Pisa and Bologna (Italy). He also taught in several foreign institutions (Texas A&M University - US, TU Delft - Netherlands, University of Stuttgart - Germany, Von Karman Institute for Fluid Dynamics – Belgium, INSA Rouen - France, NTNU Trondheim – Norway, etc.). At University of Bologna he was in charge of designing both Academic Programmes and professional courses for practitioners.

#### More relevant graduate and undergraduate teaching activities

- Developed and taught Unit Operations (B.Sc. Chemical Engineering), Chemical Engineering Equipment Design (M.Sc. Chemical Engineering), Process Safety Engineering (M.Sc. Chemical Engineering and Environmental Engineering) at the University of Bologna.
- Developed and taught Loss Prevention (M.Sc. Chemical Engineering), and Risk Analysis (M.Sc. Safety Engineering) at the University of Pisa

#### Experience in Programme management at University of Bologna

- Coordinator of the committee supervising the Academic Programs offered by the Department of Civil, Chemical, Environmental and Materials Engineering (2015 - 2021)
- Director of the M.Sc. Programme in Offshore Engineering (2018 - 2021)
- Director of the Graduate and Undergraduate Programs in Chemical Engineering (2012 - 2018)
- Director of the Ph.D. Program in Engineering and Information Technology for Structural and Environmental Monitoring and Risk Management (2019)
- Design of the M.Sc. Programme in Offshore Engineering (2018)

### Research experience

#### Research interests

Prof. Cozzani has several years of research experience in the fields of safety and sustainability of industrial processes, loss prevention and innovative energy technologies. The specific topics of his research activity are the development and optimization of sustainable processes for energy production, the study of integrated processes for energy and material recovery from wastes, safety in scale-up of innovative energy processes, development of innovative methodologies and models for hazard and risk analysis, and sustainability performance of alternative processes and on the analysis of energy transition scenarios based on P2G and P2L technologies.

#### Citational indexes

The scientific activity is documented by more than 250 peer-reviewed publications (citation indexes, May 2025: H-index 67, 15000+ citations).

#### Short Mobilities

- Industrial Hazards Unit - Institute for Safety, Informatics and Systems, European Commission Joint Research (1995-1996)
- Technical University of Graz - AMVT, Graz, Austria (1999)
- Memorial University of Newfoundland, St. John's, Canada (2012)
- INSA - Institut National des Sciences Appliquées de Rouen, Rouen, France (2015)
- Mary Kay O'Connor Process Safety Center – Texas A&M University, College Station, Texas, USA (2015)
- TU Delft, Delft, The Netherlands (2018)
- Texas A&M University – Department of Chemical Engineering, College Station, Texas, USA (2018)
- China University of Mining & Technology – School of Emergency Management and Safety Engineering, Beijing, China (2019)
- NTNU – Norwegian University of Science and Technology, Trondheim, Norway (2020)
- SCUT - South China University of Technology, Guangzhou, China (2023)
- INSA - Institut National des Sciences Appliquées de Rouen, Rouen, France – Chair of UIF – French-Italian University (2024 – 2025)

### Management of Research

Director of the Joint Research Centre on Hydrogen and Carbon Utilization established by Eni SpA and University of Bologna in 2021

PI or Co-PI of several national and international the following competitive projects (more important listed below).

#### Member of assessment panel or external assessor of research projects

Appointed panel member for the assessment of research projects:

- Norwegian Research Council – Norway (2017, 2018, 2019, 2021)
- Foundation for Science and Technology – Portugal (2020, 2021)
- Italian Ministry for University and Scientific Research – FISIR2019

Appointed as external expert for the assessment of research projects by the following organizations:

Novo Nordisk Foundation (Denmark), Natural Sciences and Engineering Research Council of Canada, American Chemical Society Petroleum Research Fund (US), Hungarian Scientific Research Fund, Slovak Research and Development Agency, Greek Ministry of Education, Cyprus Research and Innovation Foundation, Shota Rustaveli National Science Foundation (Georgia), Romanian National Council for Development and Innovation, Italian Ministry for University and Scientific Research (PRIN program).

### Research Projects

#### More significant research projects:

- Italian Ministry of Industrial Activities – FISIR: “Pure hydrogen by a totale conversion reforming process” (2003-07)
- European Commission, VII Framework Program: “Integ-Risk: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks”. PI @ UniBO (2008-13).
- MIUR (Italian Ministry of Education and Research), PRIN 2007: “Development of Key Performance Indicators for the introduction of safety and sustainability drivers in process design”. PI (2009-11).
- EC Joint Research Centre: Framework agreement for research activities on “Assessment and Management of Technological Risk generated by External Hazard Factors” (2008-2014). PI
- European Commission, VII Framework Program: “TOSCA: Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks”. PI @ UniBO (2013-15).
- European Commission, VII Framework Program: “EDEN: End-user driven DEMo for cbrNe”. PI @ UniBO (2012-16).
- SafeRra ERA-Net, “4-STER – Integrated Management of Safety and Security Synergies in Seveso plants”. PI @ UniBO
- EC DG ECHO: “WUVIEW: Wildland-Urban Interface Virtual Essays Workbench”. PI @ UniBO, member of steering committee (2019-21).
- MIUR (Italian Ministry of Education and Research), PRIN 2017: “Assessment of Cascading Events triggered by the Interaction of Natural Hazards and Technological Scenarios involving the release of Hazardous Substances”. PI (2019-22)
- European Commission, Horizon Europe: “COREu: CO<sub>2</sub> routes across Europe”. PI @ UniBO (2024-27).
- European Commission, Horizon Europe: “NicolHy: Novel Insulation Concepts For LH<sub>2</sub> Storage Tanks”. Co-PI @ UniBO (2024 – 2026)

### Industrial Projects

#### More significant industrial projects:

- Shell Research: “FREE: Fragmentation of Equipment Evaluation and assessment”. PI, 2005
- LyondellBasell: “Analysis of consequences of accident scenarios involving emergency blowdown of process equipment”. PI, 2011
- Eni Exploration and Production: “ERGO: Value at Risk of Oil Barrel”. PI, 2012
- Herambiente: “Continuous improvement of the sustainability of dry acid gas removal processes in WtE facilities”. PI, 2017
- Eni R&D: “Electric power generation from renewable energy sources on offshore platforms in the Adriatic sea”. PI, 2018
- Versalis: “Methodology for the assessment of Natech scenarios in Safety Reports”. PI, 2021
- Eni R&D: “Definition of a roadmap for the decarbonization of the north-Adriatic region”. PI, 2021

### Editorial Activity

- Associate Editor of “Safety Science” (Elsevier).
- Member of the Editorial Board di Elsevier for publications on Chemical Engineering.
- Member of the Editorial Board of the “Journal of Hazardous Materials” (Elsevier).
- Member of the Editorial Board of the “Journal of Loss Prevention in the Process Industry” (Elsevier).
- Guest Editor of special issues for Reliability Engineering and System Safety, Journal of Loss Prevention in the Process Industry, Safety Science
- Member of the scientific committees of ESREL conferences (since 2008)
- Member of the scientific committees of PSAM conferences (2008, 2010, 2012, 2020)

- Member of the scientific committees of ICheAP conferences (since 2009)
- Scientific Chairman of CISAP conference since 2012

## Service

### Appointment as assessor of educational programs

- UPM - University Putra Malaysia: assessment of the M.Sc. Program in Process Safety and Loss Prevention (2019, 2021)
- Cyprus Agency for Quality Assurance and Accreditation in Higher Education: assessment of the M.Sc. Program in Occupational Safety and Health and of the Ph.D. Program in Occupational Safety and Health (2020)

### Appointment as assessor for academic promotions

Appointed as assessor for the promotion of academic staff by the following universities:

- Indian Institute of Technology Bombay (India)
- Macquarie University (Australia)
- University of Aberdeen (UK)
- Singapore Institute of Technology (Singapore)
- Université Jean Monnet (France)
- UPC – Polytechnic University of Catalunya (Spain)
- UPM – University Putra Malaysia (Malaysia)

Appointed member of the Italian National Committee for Scientific Qualification of applicants to Professorships, for topic SC 09/D3 (Chemical Engineering Plant and Process Design) in years 2012 and 2013, and for topic SC 09/D2 (Systems, Methods and Technologies for Chemical Engineering) in year 2021.

### Nominations in international and national committees

- Chair of the Energy Section of European Federation of Chemical Engineering
- Member of the National Committee for the Protection and Prevention of Major Hazards of Italian National Civil Protection, since 2023
- Italian Delegate at the Working Party on Loss Prevention and Safety Promotion of the European Federation of Chemical Engineering (EFCE), since 2014
- Chair of the European Safety and Reliability Association Technical Committee on Chemical and Process Industry, since 2015
- Leader for the topic "Energy conversion, renewable energy and CO<sub>2</sub> mitigation of the Energy Section of the EFCE, since 2018
- Member of the executive board of the European Platform on Industrial Safety (ETPIS), 2008-2016
- Appointed as Expert for the Technical Assistance and Information Exchange Bureau (TAIEX), DG Enlargement, European Commission (2008).
- Member of the advisory panel of the FP7 ERA-net "SAFERA - Coordination of European Research on Industrial Safety towards Smart and Sustainable Growth" (2012-2015)
- Councillor of the Italian Association of Chemical Engineering (AIDIC)
- Coordinator of the Italian working party on safety in the chemical and process industry (CISAP)

## Keynote presentations

- European Forum on Safety & Security Research, PESI, Bilbao, 2016
- International Symposium on Natural Disasters, Osaka, Japan, 2017
- 42<sup>nd</sup> Meeting of the Italian Section of the Combustion Institute, Ravenna, 2019
- International Symposium on Loss Prevention, EFCE, Prague, 2022
- GPWG - Global Partnership Against the Spread of Weapons and Materials of Mass Destruction - Chemical Security sub-Working Group, Rome, 2024
- United Nations, Economic Commission for Europe, COP-13 Convention on the Transboundary Effects of Industrial Accidents, Palais de Nations, Geneva, 2024
- ESREL - European Safety and Reliability Conference, Stavanger, 2025

## Awards

- Included in the list of "world top 2% most cited scientists" by Stanford University
- Trevor Kletz award from Texas A&M University for merit in research and education in process safety (2015)
- 2025 Senior Moulton Medal – Institution of Chemical Engineers, awarded for the most meritorious paper published by IChemE during the last year

## PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
TOEFL pbt C1					

## ADDITIONAL INFORMATION

Publications (selected publications on hydrogen and energy technologies)

## Peer reviewed Journal Publications (selected)

- A. Tugnoli, G. Landucci, V. Cozzani. Sustainability assessment of hydrogen production by steam reforming. International Journal of Hydrogen Energy 33:4345-4357 (2008)
- G. Landucci, A. Tugnoli, V. Cozzani. Inherent safety key performance indicators for hydrogen storage systems. Journal of Hazardous Materials 159:554-566 (2008)
- S. Bonvicini, S. Ganapini, G. Spadoni, V. Cozzani: "The description of population vulnerability in Quantitative Risk Analysis". Risk Analysis 32:1576-1594 (2012)
- A. Tugnoli, Z. Gyenes, L. Van Wijk, M. Christou, G. Spadoni, V. Cozzani: "Reference Criteria for the Identification of Accident Scenarios in the framework of Land Use Planning". Journal of Loss Prevention in the Process Industries 26:614-627 (2013)
- N. Paltrinieri, A. Tugnoli, V. Cozzani: "Hazard identification for innovative LNG regasification technologies". Reliability Engineering and System Safety 137:18-28 (2015)
- V. Casson Moreno, V. Cozzani: "Major Accident Hazard in Bioenergy Production". Journal of Loss Prevention in the Process Industries 35:135-144 (2015)
- A. Necci, V. Cozzani, G. Spadoni, F.I. Khan: "Assessment of Domino Effect: State of the Art and Research Needs". Reliability Engineering and System Safety 143:3-18 (2015)
- G. Landucci, A. D'Aulisa, A. Tugnoli, V. Cozzani, A.M. Birk: "Modeling heat transfer and pressure build-up in LPG vessels exposed to fires". Int. Journal of Thermal Sciences 104:228-244 (2016)
- G. Landucci, A. Necci, G. Antonioni, F. Argenti, V. Cozzani: "Risk Assessment of Mitigated Domino Scenarios in Process Facilities". Reliability Engineering and System Safety 160:37-53 (2017)
- G. Landucci, G. Antonioni, A. Tugnoli, S. Bonvicini, M. Molag, V. Cozzani: "Analysis of the Viareggio LPG Accident in the perspective of HazMat transportation risk assessment". Journal of Loss Prevention in the Process Industry 49:36-46 (2017)
- M. Gerbec, M. Pontiggia, G. Antonioni, A. Tugnoli, V. Cozzani, M. Sbaouni, R. Lelon: "Comparison of UDM and CFD simulations of a time varying release of LPG in geometrical complex environment". Journal of Loss Prevention in the Process Industry 45:56-68 (2017)
- S. Bonvicini, G. Antonioni, V. Cozzani: "Assessment of the risk related to environmental damage following major accidents in onshore pipelines". J. Loss Prev. Proc. Ind. 56:505-516 (2018)
- A. Matteini, F. Argenti, E. Salzano, V. Cozzani: "A comparative analysis of Security Risk Assessment Methodologies for the Chemical Industry". Reliability Engineering and System Safety 191 (2019) 106083
- T. Iannaccone, G. Landucci, A. Tugnoli, E. Salzano, V. Cozzani: "Sustainability of cruise ship fuel systems". Journal of Cleaner Production 260:121069 (2020)
- Y. Di Martino, S. E. Duque, G. Reniers, V. Cozzani: "Making the chemical and process industries more sustainable: Innovative decision-making framework to incorporate technological and non-technological Inherently Safer Design (ISD)". Journal of Cleaner Production, 296:126421 (2021)
- A. Crivellari, V. Casson Moreno, V. Cozzani, I.M. Dincer: "Multi-criteria sustainability assessment of potential methanol production processes". Journal of Cleaner Production, 293:126226 (2021)
- M. Cipolletta, M. D'Ambrosio, V. Casson Moreno, V. Cozzani: "Enhancing the sustainability of biodiesel fuels by inherently safer production processes". Journal of Cleaner Production 344:131075 (2022)
- G.E. Scarponi, G. Landucci, A.M. Birk, V. Cozzani: "Three dimensional CFD simulation of LPG tanks exposed to partially engulfing pool fires". Process Safety and Environmental Protection 150:385-399 (2021)
- A. Misuri, V. Cozzani: "A Paradigm Shift in the Assessment of Natech Scenarios in Chemical and Process Facilities". Process Safety and Environmental Protection, 152:338-351 (2021)
- A. Crivellari, S. Bonvicini, A. Tugnoli, V. Cozzani: "Key Performance Indicators for Environmental Contamination caused by Offshore Oil Spills". Process Safety and Environmental Protection, 153:60-74 (2021)



- A. Bernatik, D. Rehak, V. Cozzani, P. Foltin, J. Valasek, F. Paulus: "Integrated Environmental Risk Assessment of Major Accidents in the Transport of Hazardous Substances". *Sustainability* 13:11993 (2021)
- A. Tugnoli, G.E. Scarponi, G. Antonioni, V. Cozzani: "Quantitative Assessment of Domino Effect and Escalation Scenarios caused by Fragment Projection". *Reliability Engineering and System Safety* 217:108059 (2022)
- M. Cipolletta, M. D'Ambrosio, V. Casson Moreno, V. Cozzani: "Enhancing the sustainability of biodiesel fuels by inherently safer production processes". *J. Cleaner Production* 344:131075 (2022)
- N. Tamascelli, R. Solini, N. Paltrinieri, V. Cozzani: "Learning from Major Accidents: a Machine Learning Approach". *Computers and Chemical Engineering*, 162:107786 (2022)
- X. Guo, L. Ding, J. Ji, V. Cozzani: "A cost-effective optimization model of safety investment allocation for risk reduction of domino effects". *Reliability Engineering & System Safety*, 225:108584 (2022)
- Z.Wang, S.Hou, M.Zhang, J.Xu, Z.Gao, V.Cozzani, B.Zhang: "Assessment of the mass burning rate of LNG pool fires by a validated CFD model". *Process Safety and Environmental Protection*, 168:642-653 (2022)
- J.Zhou, G.Reniers, V.Cozzani: "A Petri-net approach for firefighting force allocation analysis of fire emergency response with backups". *Reliability Engineering & System Safety*, 229:108847 (2023)
- A.Dal Pozzo, S.Abagnato, V.Cozzani: "Assessment of cross-media effects deriving from the application of lower emission standards for acid pollutants in waste-to-energy plants". *Science of the Total Environment*, 856:159159 (2023)
- N. Tamascelli, N. Paltrinieri, V.Cozzani: "Learning From Major Accidents: A Meta-Learning Perspective". *Safety Science* 158:105984 (2023)
- M. Iaiani, A. Tugnoli, V. Cozzani: "Identification of cyber-risks for the control and safety instrumented systems: a synergic framework for the process industry". *Process Safety and Environmental Protection*, 172:69-82 (2023)
- F. Ricci, V. Casson Moreno, V. Cozzani: Natech accidents triggered by cold waves  
▪ *Process Safety and Environmental Protection* 173:106–119 (2023)
- Misuri, F. Ricci, R. Sorichetti, V. Cozzani: "The Effect of Safety Barrier Degradation on the Severity of Primary Natech Scenarios". *Reliability Engineering and System Safety* 235:109272 (2023)
- F. Zanobetti, S. Martynov, V. Cozzani, H. Mahgerefteh: "Multi-objective economic and environmental assessment for the preliminary design of CO2 transport pipelines". *Journal of Cleaner Production* 411:137330 (2023)
- F. Zanobetti, G. Pio, S. Jafarzadeh, M. Muñoz Ortiz, V. Cozzani: "Inherent safety of clean fuels for maritime transport". *Process Safety and Environmental Protection*, 174:1044-1055 (2023)
- M. Cipolletta, A. Crivellari, V. Casson Moreno, V. Cozzani:  
▪ "Design of sustainable offshore hybrid energy systems for improved wave energy dispatchability". *Applied Energy* 347:121410 (2023) 21p
- F. Zanobetti, G. Pio, S. Jafarzadeh, M. Munoz Ortiz, V. Cozzani:  
▪ "Decarbonization of maritime transport: Sustainability assessment of alternative power systems". *Journal of Cleaner Production* 417:137989 (2023)
- F. Ricci, M. Yang, G. Reniers, V. Cozzani: "Emergency response in cascading scenarios triggered by natural events". *Reliability Engineering and System Safety* 243:109820 (2024)
- N. Tamascelli, A. Dal Pozzo, G.E. Scarponi, N. Paltrinieri, V. Cozzani: "Assessment of Safety Barrier Performance in Environmentally Critical Facilities: Bridging Conventional Risk Assessment Techniques with Data-Driven Modelling". *Process Safety and Environmental Protection* 181:294–311 (2024)
- Schiaroli, G.E. Scarponi, G. Antonioni, V. Cozzani: "Hazard footprint of alternative fuel storage concepts for hydrogen-powered urban buses". *International Journal of Hydrogen Energy* 50:1430-1442 (2024)
- Md. Tanjin Amin, G.E. Scarponi, V. Cozzani, F.I. Khan: "Dynamic Domino Effect Assessment (D2EA) in tank farms using a machine learning-based approach". *Computers and Chemical Engineering* 181:108556 (2024)
- F. Ricci, A. Misuri, G.E. Scarponi, V. Cozzani, M. Demichela: "Vulnerability Assessment of Industrial Sites to Interface Fires and Wildfires". *Reliability Engineering and System Safety* 243:109895 (2024)
- G.E. Scarponi, V. Cozzani, G. Antonioni, F. Doghieri: "Modeling the behavior of LPG tanks exposed to partially engulfing pool fires". *Process Safety and Environmental Protection* 182:1072-1085 (2024)
- F. Tamburini, S. Bonvicini, V. Cozzani: "Consequences of subsea CO2 blowouts in shallow water". *Process Safety and Environmental Protection* 183:203-216 (2024)
- N. Tamascelli, G.E. Scarponi, M.T. Amin, Z.Sajid, N. Paltrinieri, F.Khan, V. Cozzani:  
▪ "A neural network approach to predict the time-to-failure of atmospheric tanks exposed to external fire". *Reliability Engineering and System Safety* 245:109974 (2024) 13p
- F. Amaducci, A. Misuri, S. Bonvicini, E. Salzano, V. Cozzani:

- "Quantitative Risk Assessment of Natech Scenarios triggered by Earthquakes involving Pipelines". Reliability Engineering and System Safety 245:109993 (2024)

Books:

- I. Dincer, V. Cozzani, A. Crivellari: "Hybrid Energy Systems for Offshore Applications". Elsevier, Amsterdam, 2021.
- V. Cozzani, G. Reniers: "Dynamic Risk Assessment and Management of Domino Effects and Cascading Events in the Process Industry". Elsevier, Amsterdam, 2021.
- F.I. Khan, V. Cozzani, G. Reniers: "Domino Effect: Its Prediction and Prevention". Methods in chemical process safety - Volume 5. Elsevier, Amsterdam, 2021.
- A. Misuri, V. Cozzani: "A Roadmap for the Comprehensive Assessment of Natech Risk: Management and Control of Technological Accidents Triggered by Natural Hazards in the Framework of Climate Change". Elsevier, Amsterdam, 2024.
- V. Cozzani, F. Paolacci: "Management Strategies and Resilience Against NaTech Events". Springer, Cham, Switzerland, 2025.

*(Si autorizza il trattamento dei dati personali ai sensi del Regolamento UE n. 679/2016 e del D.Lgs. n. 196/2003 e successive modifiche)*