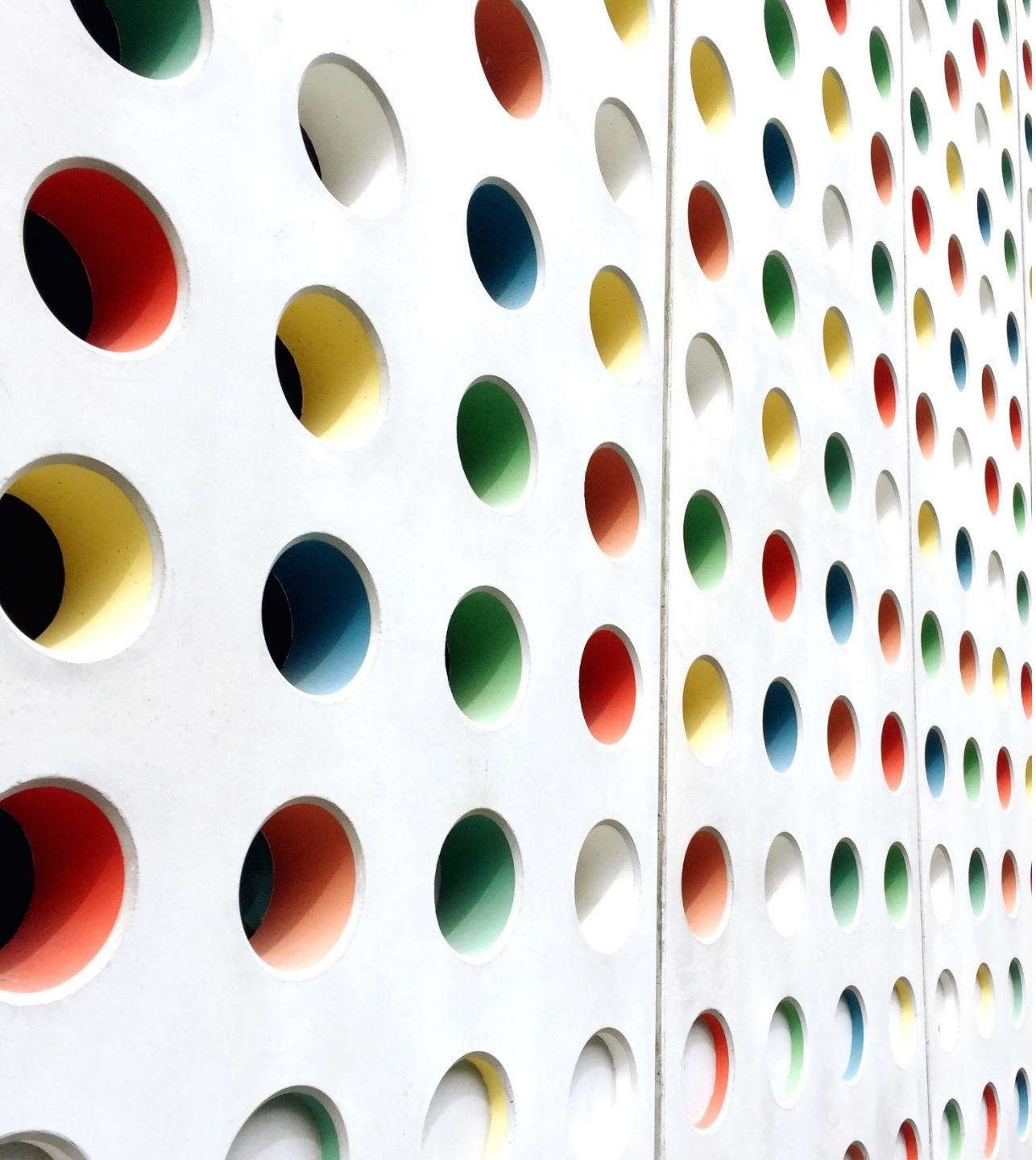


DFG 2020
BECAUSE RESEARCH MATTERS

Amirkabir University of Technology
(Tehran Polytechnic)

AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

Dr. Ebrahim Farrokh:

- Assistant Professor and head of rock mechanics and tunnelling's group, Amirkabir University of Technology, Mining Engineering department.
- Over 15 years of experience in hard rock and soft ground TBM tunneling projects.
- Job site supervisor for technical support of TBM tunneling
- Experience in tunnel design, instrumentation, monitoring, exploration, rock mass evaluation, TBM operational parameters evaluation, ground treatment
- Numerical analysis for the tunnel support stability
- Technical jobsite support for TBM tunneling problems
- Technical support for TBM selection and performance evaluation
- TBM lace design

PhD Students:

- Dariush Mohammadi: PhD candidate in rock mechanics
- Reza Nikbakht: PhD candidate in rock mechanics
- Mohammadreza Ajamzadeh: PhD candidate in Mining Eng.

MS Students:

- Seyed Jalil Araghi: rock mechanics
- Shahin Fattahi: rock mechanics
- Gholamreza Esmaeelpour: Tunneling
- Mostafa Tarafrava: rock mechanics
- Zabihollah Fayazi: Tunneling

Research Group Interest

- Simulation of EPB TBM cutterhead performance considering the shape of its openings
- Model development for the evaluation of EPB TBM torque components and the conditioned soil workability in the chamber
- Development of a model for the consistency index of the conditioned soil within the excavation chamber
- Development of a model for the torque components of the EPB TBMs
- Simulation of gage cutters and tunnel face interaction
- Laboratory simulation of large-scale cutter wear

Group Research/Industrial Projects

2011: NSF funded project on TBM advance rate and utilization factor evaluation (Hyundai Eng. And Construction).

2014: Development of TBM Cutterhead Design and Optimum Excavation Method (Hyundai Eng. And Construction).

2015: Development of new abrasion test for hard rock TBM tunneling (Hyundai Eng. And Construction).

2016: Development of new soil abrasivity apparatus for EPB TBM tunneling (Hyundai Eng. And Construction).

2017: Research on rock cavern construction management and equipment allocation (Hyundai Eng. And Construction).

2020: Operation management in EPB TBM to control maximum surface settlement (Tehran metro line 6).

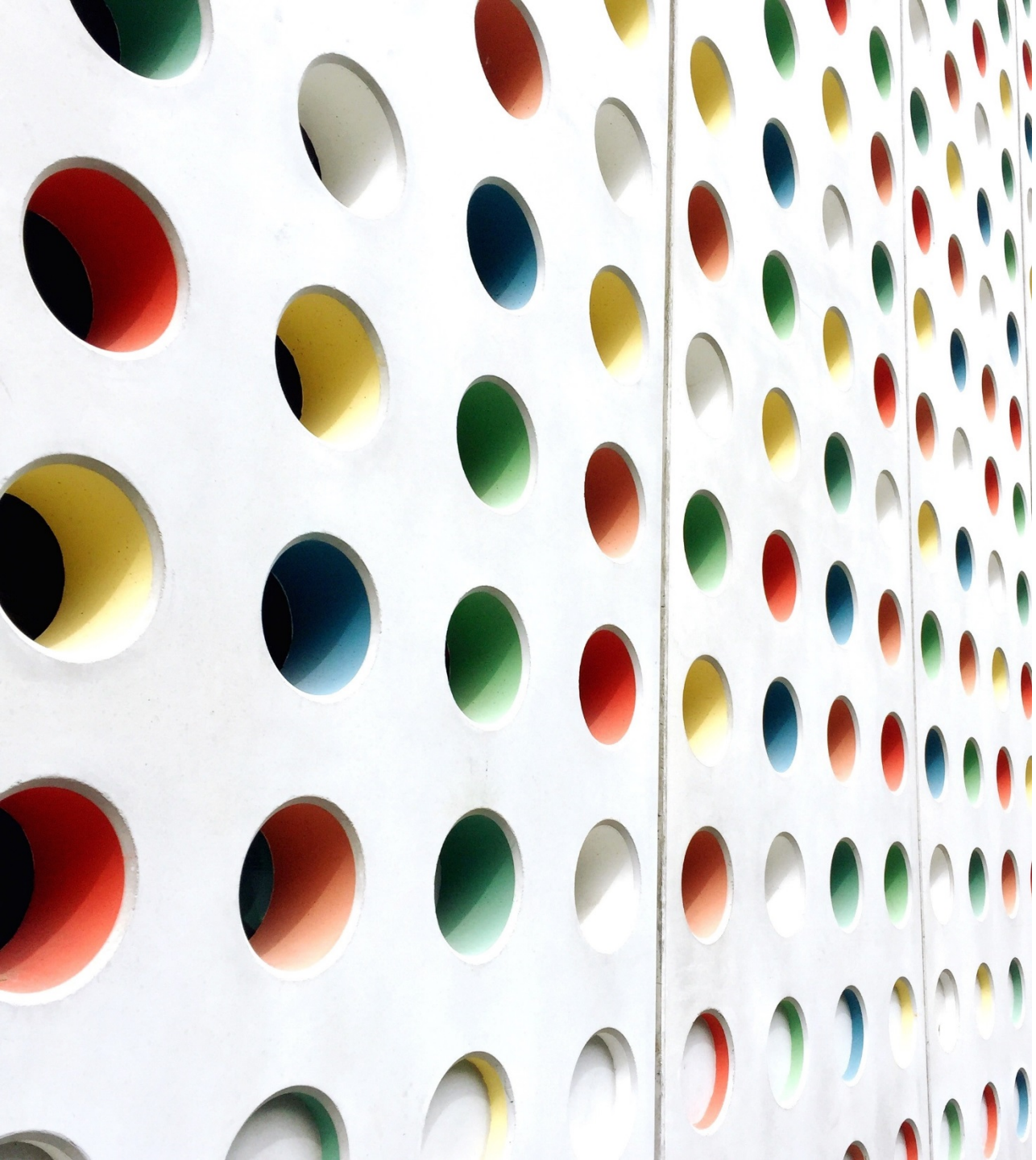
2021: Lace design for hard rock TBMs (Tunnelsaz machine).

Group Supervised Labs

Group Contact Information

Dr. Farrokh :

- Email: e.farrokh@aut.ac.ir
- Mailing Address: Mining Eng. Department, Amirkabir University of Technology, Hafez Ave., Tehran, Iran.
- Tel.: +98 21 64542900 +98 9130189208
- Fax: +98 21 66405846



DFG 2020
BECAUSE RESEARCH MATTERS

Amirkabir University of Technology
(Tehran Polytechnic)

AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

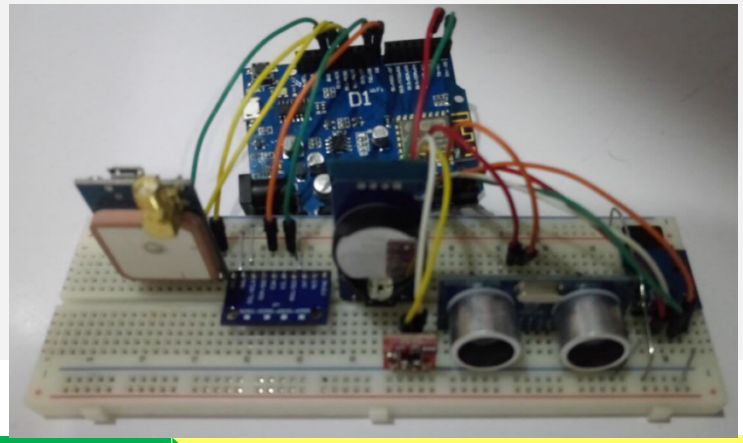
1. Maryam Amir Haeri (University of Twente– Big data analytics)
2. Amir Golroo (Amirkabir Uni of Tech – Pavement)
3. Mahmoud Mesbah (Amirkabir Uni of Tech – Trasportation)
4. Mehdi Rasti (Amirkabir Uni of Tech – Internet of Things)
5. Bahram Taheri (Amirkabir Uni of Tech – Nexus and Circularity)
6. Michael P. Wistuba (Technical University Braunschweig - Pavement)






Research Group Interest

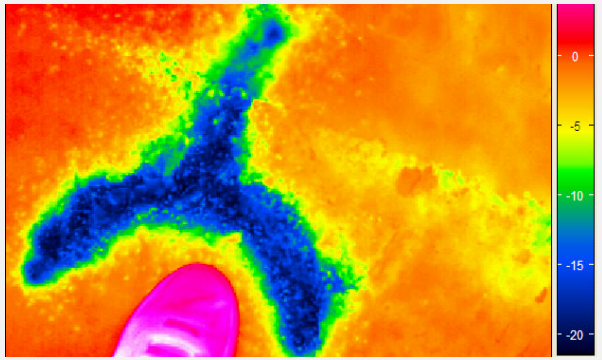
1. Application of IOT and machine learning techniques in Transportation infrastructure data acquisition and analytics
2. Intelligent Transportation Systems
3. Public Transport
4. Transportation Network Analysis
5. Big Data analysis in Transport
6. A Nexus Framework for the intelligent transportation infrastructure based on circular econom



NEXUS
NEXUS & HSE CENTER

Research Group Interest

7. Testing of road building materials
8. Modeling and simulations
9. Quality control of construction process
10. Pavement maintenance management



Group Research/Industrial Projects

1. Title: IOT-based data acquisition system development in pavement condition evaluation

Team: Amirkabir Uni of Tech and Technical Uni of Braunschweig

Funding Organization: DFG

2. Title: Green Energy Center of Iran (GECI)

Team: Nexus Center of Amirkabir Uni of Tech and Technical University of Berlin (TUB)

Funding Organization: BMU and IKI

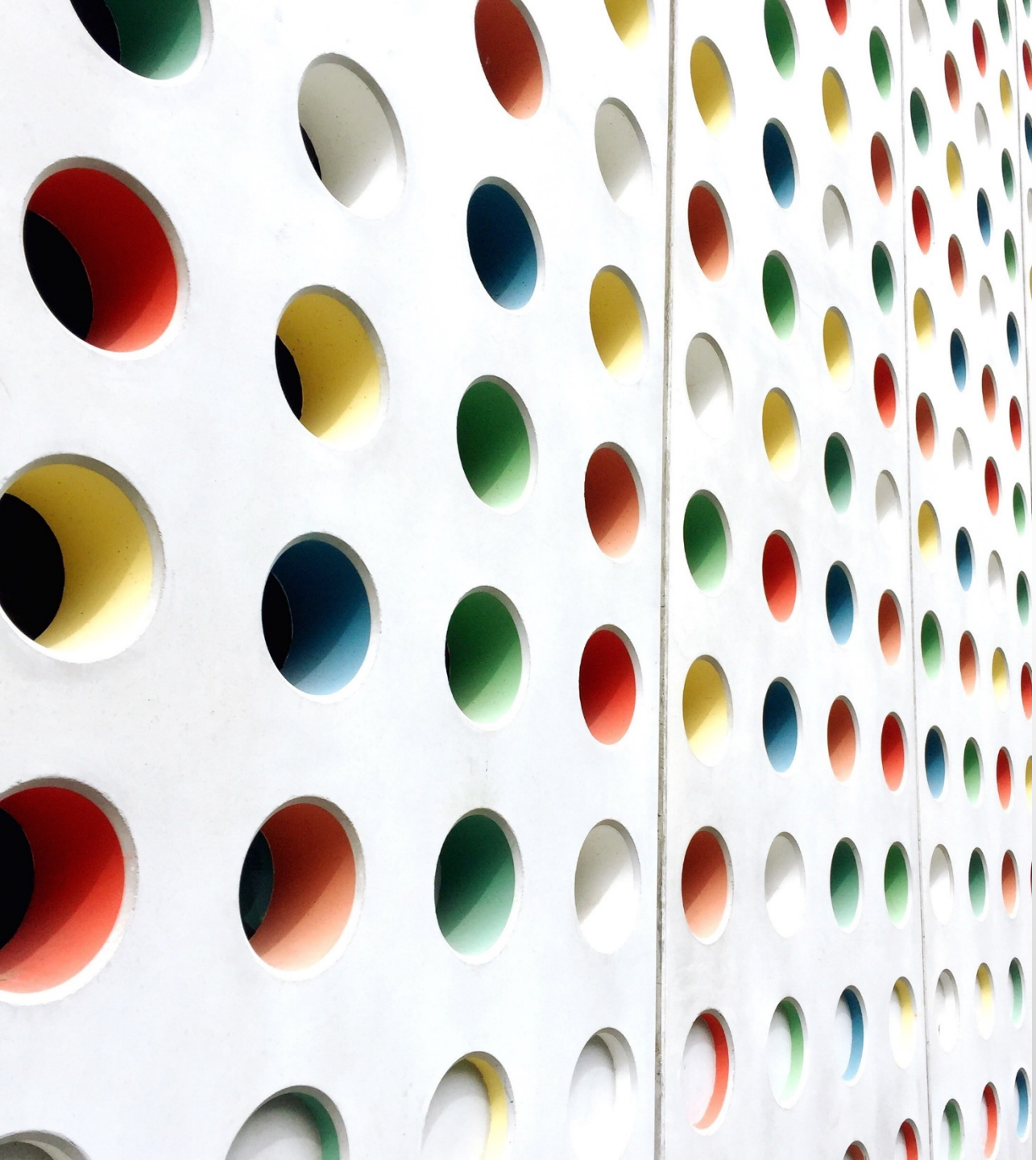
Group Supervised Labs

1. ISBS - Braunschweig Pavement Engineering Centre
2. Attain – AmirKabir Artificial Intelligence and Image Processing Lab
3. The Nexus and HSE Center – Amirkabir University of Technology

Group Contact Information

Contact Person:

- Amir Golroo
- agolroo@aut.ac.ir
- +98-912-812-9406
- www.aut.ac.ir/agolroo



DFG 2020
BECAUSE RESEARCH MATTERS

Amirkabir University of Technology
(Tehran Polytechnic)

AUT - DFG

Joint Matchmaking Webinar

April 2021

Contents

- Research Group CV
- Research Group Interest
  - State of Art
  - Novelty of This Research
  - Specification of the model
  - Specification of the foundation
  - Expected Results
- Group Research/Industrial Projects
- Group Supervised Labs
- Group Contact Information

Research Group CV

Group Supervisor

Prof. Dr.-Ing. Frank Rackwitz

Academic qualifications

- **Dr.-Ing. degree in Civil Engineering at the TU Berlin (2002)**
- **Dipl.-Ing. degree in Civil Engineering at the TU Berlin (1997)**

Present academic position

- **Managing Director of the Department of Civil Engineering at TU Berlin**
- **Full Professor and Head of the Chair of Soil Mechanics and Geotechnical Engineering at Technische Universität (TU) Berlin.**

Previous academic positions

Professor at the University of Applied Sciences in Regensburg (2013-2015)

Visiting Professor at the Brandenburg Technische Universität Cottbus (2012-2013)

Post-Doc Research Affiliate, Geotechnical Institute at the TU Berlin (2002-2012)

Research Assistant at the Geotechnical Institute at the TU Berlin (1998-2002)

Research Field

Theoretical and Experimental Soil Mechanics and Soil Dynamics, Numerical Modelling of Geotechnical Problems, Constitutive Modelling of Granular Materials, Onshore and Offshore Foundations of Wind Turbines.

Complete CV Could be accessible: https://www.grundbau.tu-berlin.de/fileadmin/fg99/Mitarbeiter/Rackwitz/CV_Ra_02_2020_en_RGC_Layout.pdf

- **Research activities**

Over 60 research papers,

https://orcid.org/0000-0003-2736-9193

- **DFG Projects**

Five completed and current projects

https://gepris.dfg.de/gepris/person/19575733?context=person&task=showDetail&id=19575733&

- **Five most representative publications in recent five years:**

- Le, V. & Rackwitz, F. (2020). A New Cyclic Simple Shear Test Procedure with Multidirectional Loading. Geotechnical Testing Journal 43, No. 1, ASTM, pp. 275-286. DOI: 10.1520/GTJ20180074.
- Rackwitz, F. (2020). Possibilities and Limitations of ALE Large Deformations Analyses in Geotechnical Engineering. In Th. Triantafyllidis (ed.): Recent Developments of Soil Mechanics and Geotechnics in Theory and Practice. Lecture Notes in Applied and Computational Mechanics (LNACM), Vol. 91, Springer, pp. 97-112.
- Labenski, J, Remspecher, F., Le, V., Moormann, Ch. & Rackwitz, F. (2019). Lateral bearing behaviour of vibratory-driven monopiles in different model test set-ups. Int. J. of Physical Modelling in Geotech., ICE (ahead of print), DOI: 10.1680/jphmg.18.00090.
- Bakroon, M., Daryaei, R., Aubram, D. & Rackwitz, F. (2019). Numerical evaluation of buckling in steel pipe piles during vibratory installation. Soil Dynamics and Earthquake Engineering, Elsevier, Vol. 122, July 2019, pp. 327-336. DOI:10.1016/j.soildyn.2018.08.003
- Aubram, D., Rackwitz, F. & Savidis, S. (2017). Contribution to the Non-Lagrangian Formulation of Geotechnical and Geomechanical Processes. In Th. Triantafyllidis (ed.): Holistic Simulation of Geotechnical Installation Processes: Theoretical Results and Applications, Lecture Notes in Applied and Computational Mechanics, Vol. 82, Springer, pp 53-100. DOI 10.1007/978-3-319-52590-7.

Memberships

- **Member of the Executive Board of the German Society of Geotechnical Engineering (DGGT).**
- **Member of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE).**
- **Member of the Committee DIN 18088 "Wind Turbines", Vice Chairman of the DGGT Working Group "Research in Geotechnical Engineering".**
- **German Member of ISSMGE Technical Committee 104 "Physical Modelling in Geotechnics".**

Up to five representative publications beyond the recent five years

- Aubram, D., Savidis, S. & Rackwitz, F. (2016). *Theory and Numerical Modeling of Geomechanical Multimaterial Flow*. In: Holistic Simulation of Geotechnical Installation Processes. Benchmarks and Simulations. Triantafyllidis, Th. (Hrsg.), LNACM, Vol. 80, Springer, pp. 187-229. DOI 10.1007/978-3-319-23159-4_10.
- Aubram, D., Rackwitz, F., Wriggers, P. & Savidis, S. (2015). *An ALE method for penetration into sand utilizing optimization-based mesh motion.* Computers and Geotechnics, Vol.65, No.4, Elsevier, pp. 241-249, DOI 10.1016/j.compgeo.2014.12.012
- Rackwitz, F., Savidis, S.A. & Rickriem, J. (2013). *Web-based Data and Monitoring Platform for Complex Geotechnical Engineering Projects.* J. Geot. Geolog. Engrg., Vol.31, No.3, Springer, pp. 927-939, DOI 10.1007/s10706-012-9592-4.
- Rackwitz, F., Savidis, S.A. & Tasan, H. E. (2012). *New design approach for large diameter offshore monopiles based on physical and numerical modelling.* In: R.D. Hryciw, A. Athanasopoulos-Zekkos & N. Yesiller (eds.): Geotechnical Special Publication GSP No. 225. GeoCongress 2012. State of the Art and Practice in Geotechnical Engineering. Proc. GeoCongress 2012, ASCE, pp. 356-365.
- Rackwitz, F. & Schüßler, M. (2010). *1g Model Test on Granular Soil Columns for Ground Improvement of Very*
- *Soft Soil.* Proc. ICPMG2010, 2010, Zurich, Switzerland, Vol. 2, pp. 1351-1356.

Iranian Partner

Prof. Leila Haj Najafi

Ph.D. Earthquake Engineering, Amirkabir University of Technology (Tehran Polytech)

Academic Position

Assistant Professor, Department of Civil Engineering, South Tehran Branch, Azad University, Tehran. Iran.

Faculty of Technical and Engineering, Department of Civil and Environmental Engineering, Tel:+989122049302, email: lila_najafi@aut.ac.ir , l_najafi@azad.ac.ir

Complete CV, research activities and publication could be accessible: http://newfaculty.azad.ac.ir/file/download/teachersInfo/1616834188-leila-haj-najafi-cv.pdf

Memberships

- **Member of National Elites Foundation of Iran.**
- **Member of Iranian Society of Civil Engineers.**
- **Member of Iranian Association for Earthquake Engineering.**

Five representative publications

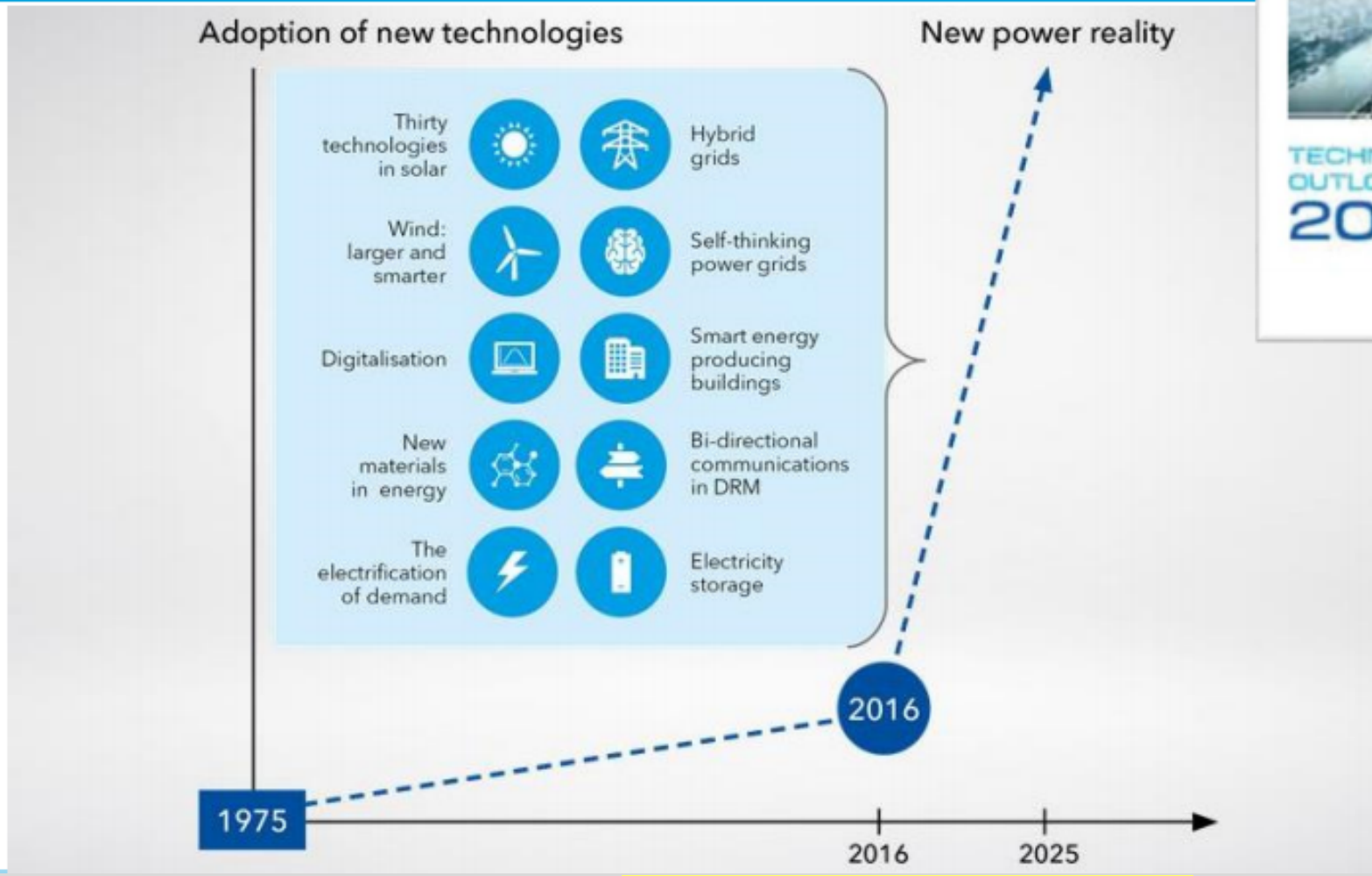
- Haj Najafi L. and Tehranizadeh M., Equation for Achieving Efficient Length of Link-beams in Eccentrically Braced Frames, *Journal of Constructional Steel Research*, 130(1), March 2017, http://dx.doi.org/10.1016/j.jcsr.2016.11.020
- Haj Najafi L., Tehranizadeh M. and Banazadeh M., Reliability- based evaluation of load factor using β unzipping and Bayesian method, *SCIENTIA IRANICA, TRANSACTION A- CIVIL ENGINEERING*, Vol:4 (20), 2013. . http://scientiairanica.sharif.edu/article_1497.html
- Haj Najafi L. and Tehranizadeh M., Reliability-based Evaluation of Loss Subjected to Distribution of Building Nonstructural Components in Height, *Journal of Architecture Civil Engineering Environment (ACEE),* 10 (2), September 2017, http://acee-journal.pl/1,7,43,Issues.html.
- Haj Najafi L. and Tehranizadeh M., Decoupling story-cost dependencies based on a proposed modal approach, *Australian Journal of Structural Engineering*, 1(1), 2018. DOI: 10.1080/13287982.2018.1456613.
- Haj Najafi L. and Tehranizadeh M., Ground motion selection and scaling in practice, *Periodica Polytechnica*, Civil Engineering, 59(2), 233-248, 2015, DOI:10.3311/PPci.7808. https://pp.bme.hu/ci/article/view/7808.

Research Group Interest:

Subject of research: Effect of Soil Structure Interaction on Performance Fragility Curves of Offshore Wind Energy Turbine Constructions Subjected to Wind, Wave and Seismic Loads.

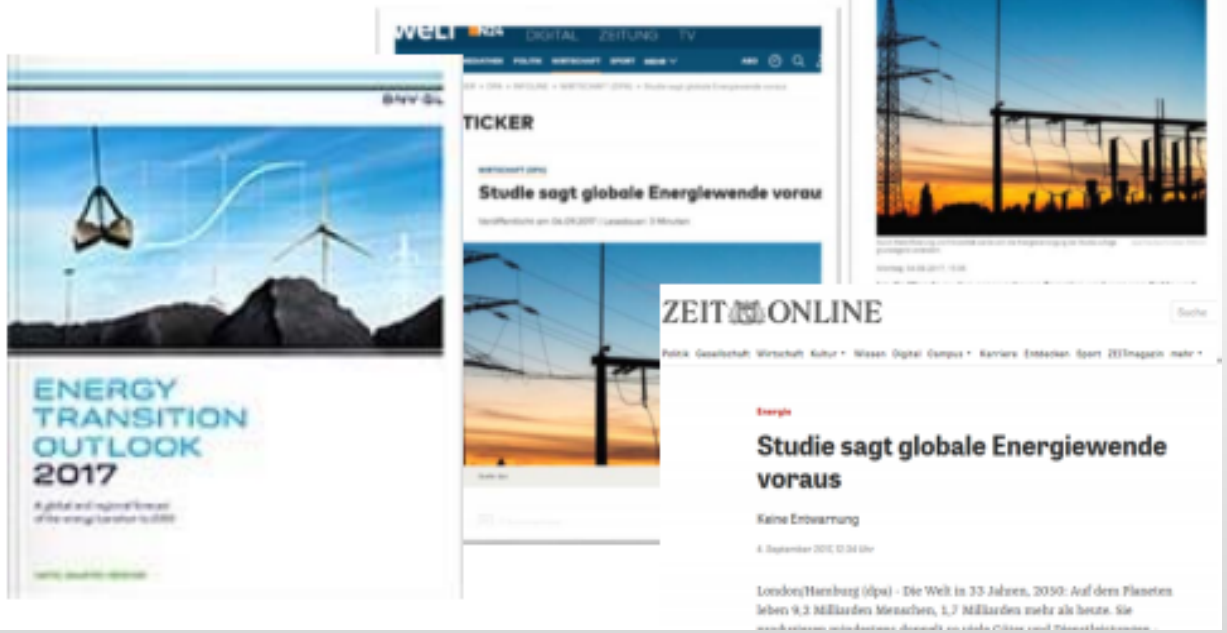
State of Art

Technology Outlook 2025
10 technology trends creating a new power reality
Exponential growth and change in the next 10 years



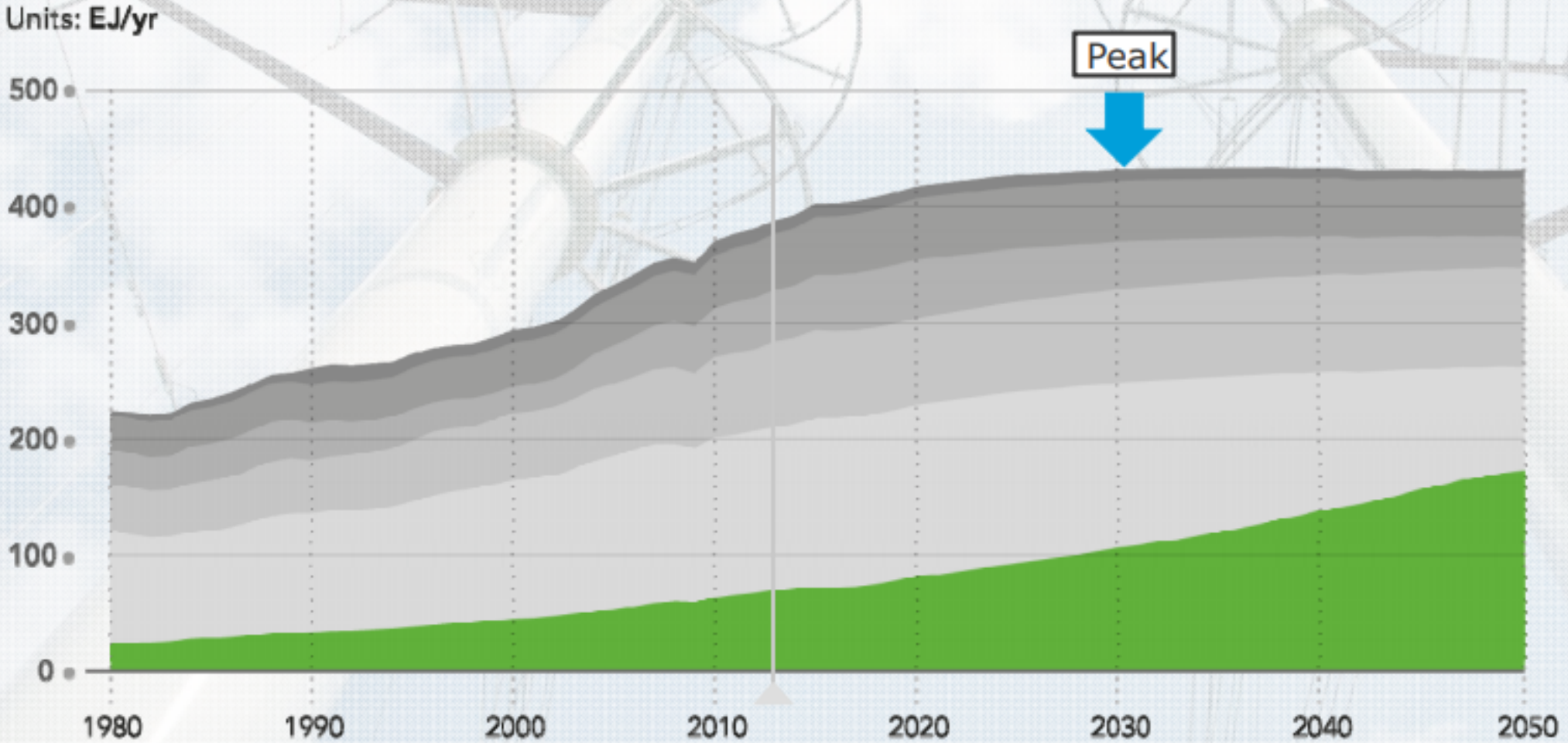
Key takeaways Energy Transition Outlook

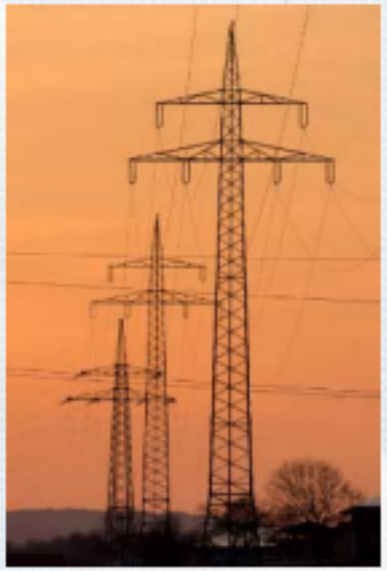
- Global primary energy supply will plateau after 2030 (efficiencies, EVs, growth of renewables).
- Massive growth of Electric vehicle sales: 50% of new cars (2025: Europe, 2035 World).
- Digitalization will lead to higher efficiency & better connectivity of all elements in the power system.
- In 2050 energy generation will be shared between fossil and non-fossil resources in 50%-50%.
- Electricity will be the main energy carrier by 2050.
- Gas will be biggest source of primary energy supply.



Further Information: eto.dnvgl.com

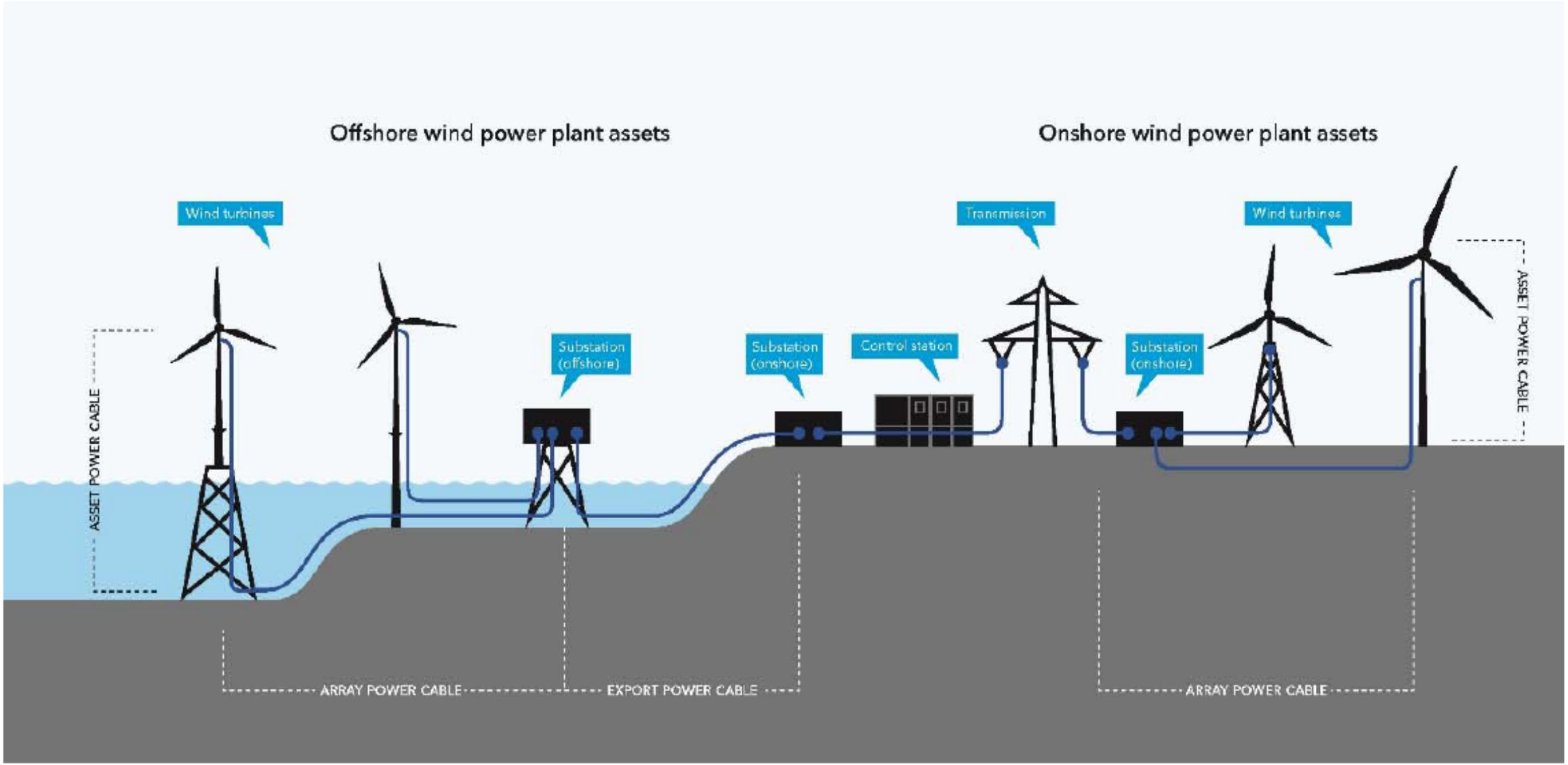
World final energy demand by energy carrier
Electricity will be the main energy carrier by 2050





Massive growth of solar and wind by 2050
Renewables main source of electricity generation.

Offshore Wind – A Complex Structure



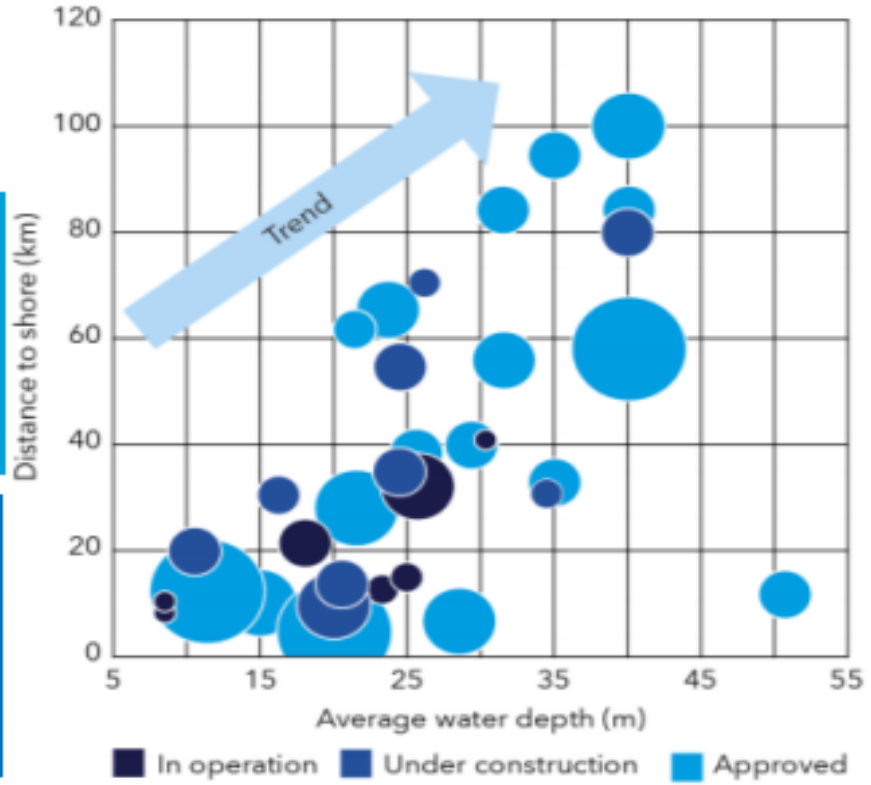
Wind: larger and smarter
Offshore wind, Sizes of wind turbines, Offshore wind monopiles
Continued process of industrialization

By 2025 onshore wind will be the least-cost option for building excess electricity capacity almost universally

Fixed offshore wind moves towards deeper waters, further from shore

Floating offshore wind is entering demonstration phase

Distance to shore and average water depth of a representative selection of European wind farms. The size of the bubbles are indicative of the capacity of the wind farms.

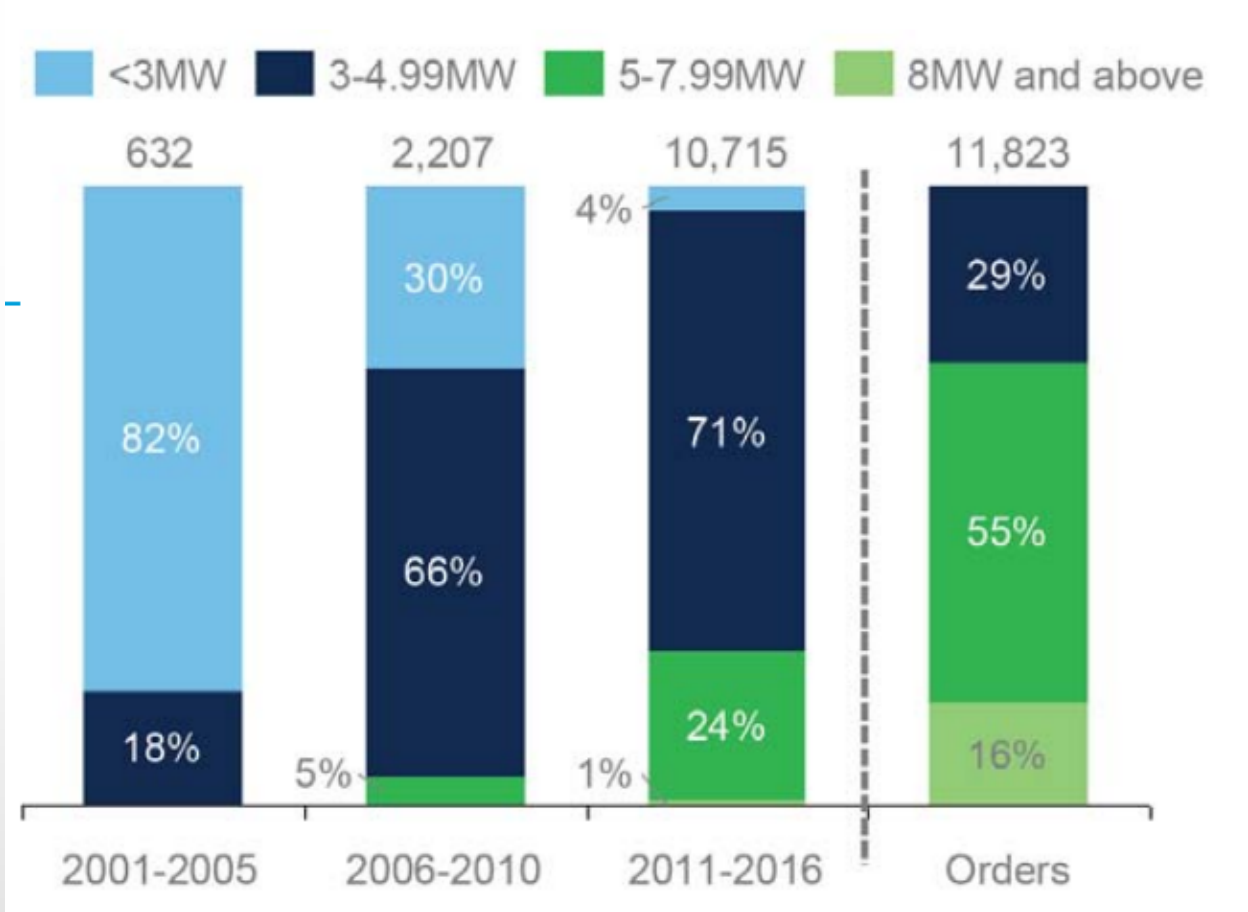


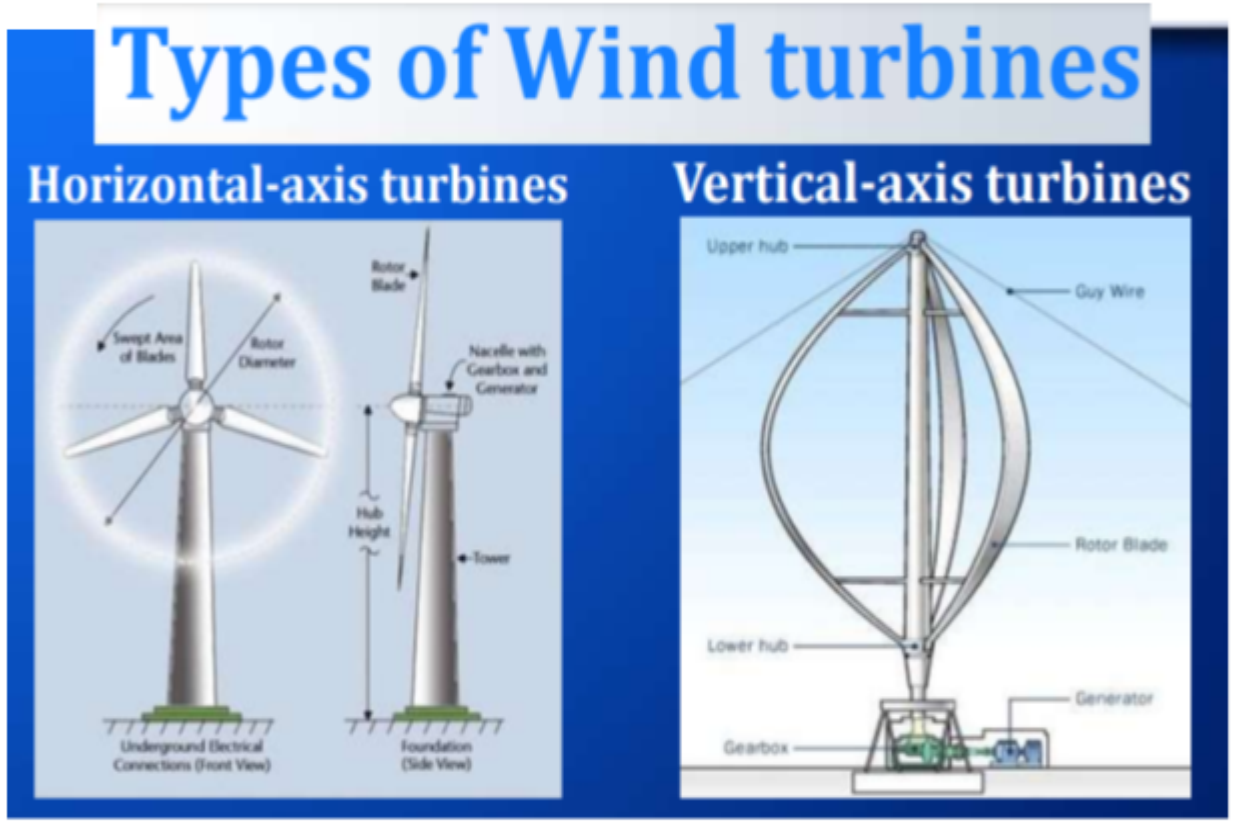
Offshore Market Review – Summary table

	UK	Germany	NL	Japan	USA
Market Size/year 2020-2025	Base - 1GW High – 1.7GW Low – 500MW	Base - 750MW High – 1GW Low – 500MW	Base - 600MW High – 800MW Low - 400MW	Base - 100MW High – 1GW Low – 50MW	Base – 800MW High – 1.5GW Low – 200MW
Political Risks	High - 'Anti-renewables' Gov. elected & austerity agenda may mean no money for offshore wind	Low - Moving to system of competitive tenders that may cause hiatus but strong support	Mid - Energiakkord provides strong cross societal agreement but change of Gov. has stopped development before	High - Immature market. Limited commitment from Gov. Focus on floating	High. Policy drivers remain a challenge. Presidential election in 2016 very important, although EPA introduced Clean Power Plant Act
Commercial challenges	Strong cost reduction focus through extremely competitive tenders; Pressure for local content	Move towards competitive tendering	Expected to be very competitive tendering	Immaturity of market & supply chain; Strong focus on local content – partnerships important	Need to demonstrate local economic benefit and cost competitiveness; immature market

Offshore Market Review – Summary table

	UK	Germany	NL	Japan	USA
Sites	Mainly Round 3, although potential nearshore leasing round	Currently leased with limited scope for future leasing rounds.	Roadmap foresees 5 tenders for 700MW zones	Very uncertain. Fixed will have to be close to shore. Floating tbc	6GW of capacity leased in 5 east coast States. Another 6-7GW expected. West Coast is floating
Depth	30-50m	30-50m	18-38m	Fixed 0-30m	Fixed 10-59m
Distance to shore	10-150km	40km+	25-38km	Fixed 0-20km	Fixed 15-54km
Wind Speeds	8.5-10m/s	9.5m/s+	9.6m/s for Borssele	7.5-9m/s	8-9m/s
Technical Challenges	40m+ wind farms. Super far offshore. Bigger wind farms (1GW+)	Depth and far offshore. Cross-project wakes	Relatively 'easy' sites (shallow and close to shore)	Typhoons; Earthquakes; Unique building codes; Floating	Hurricanes; Ice in Great Lakes; West Coast is floating; Jones Act means all vessels to ports need to be US built
Substation voltage levels	33kV, NAREC and Blythe demo sites expected to use 66kV	33 kV; discussions if ~66kV are the better option (to reduce the number of strings)	66kV confirmed for all upcoming 5 tenders	No standard so far	34.5kV
Grid	50Hz; Trend towards greater provision of ancillary services	50Hz; connection provided by TSO.	50Hz: Grid connections be provided by Tennet.	50Hz in East. 60Hz in West. Market expect to be unbundled	60Hz; Developer build.



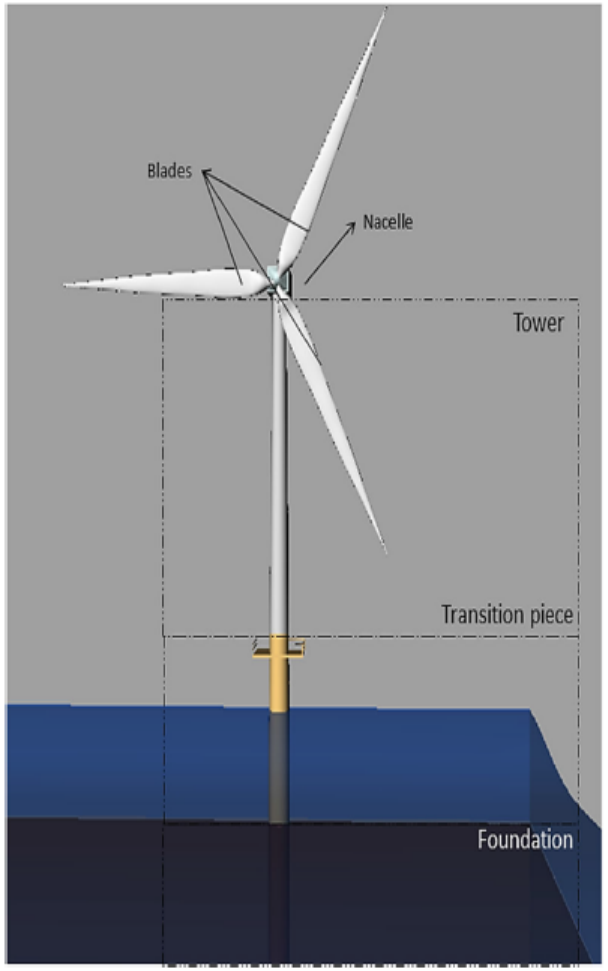


HAWT **VAWT**

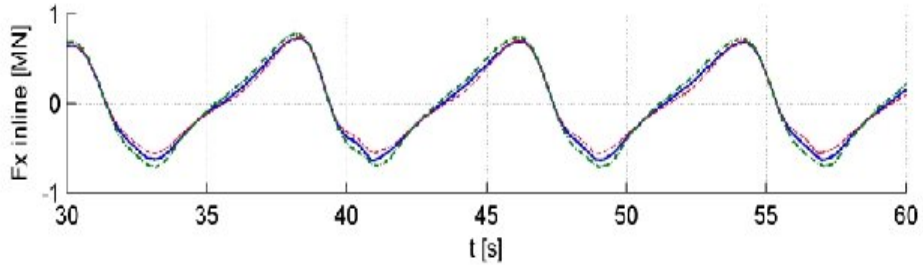
The Increase need for offshore turbines

Novelty of This Research:

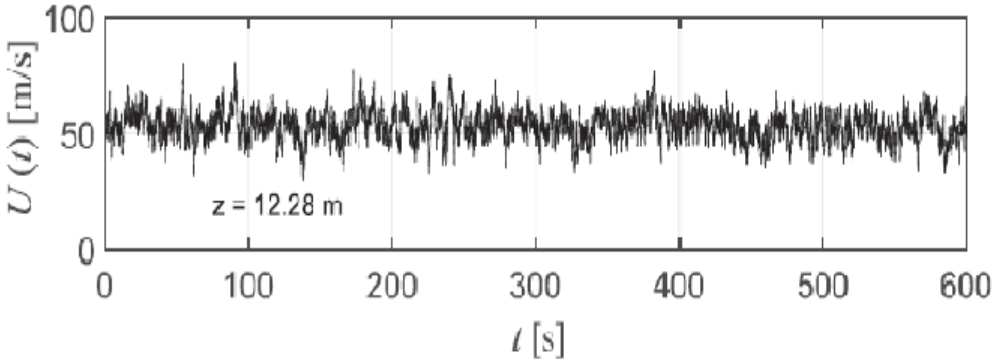
No 1.: Concurrent consideration of wind, earthquake and water wave loads.



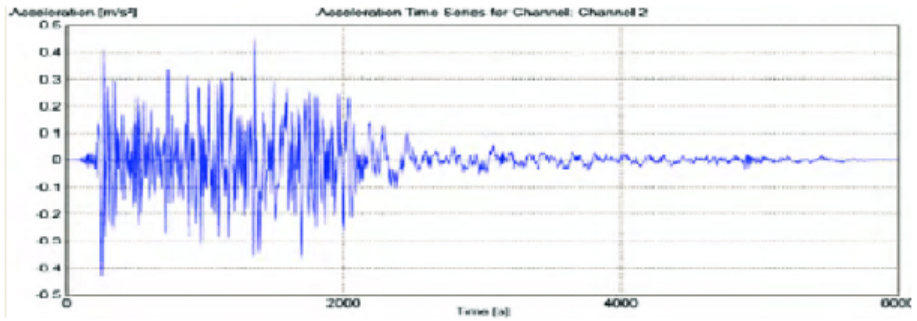
Monopile offshore wind turbine



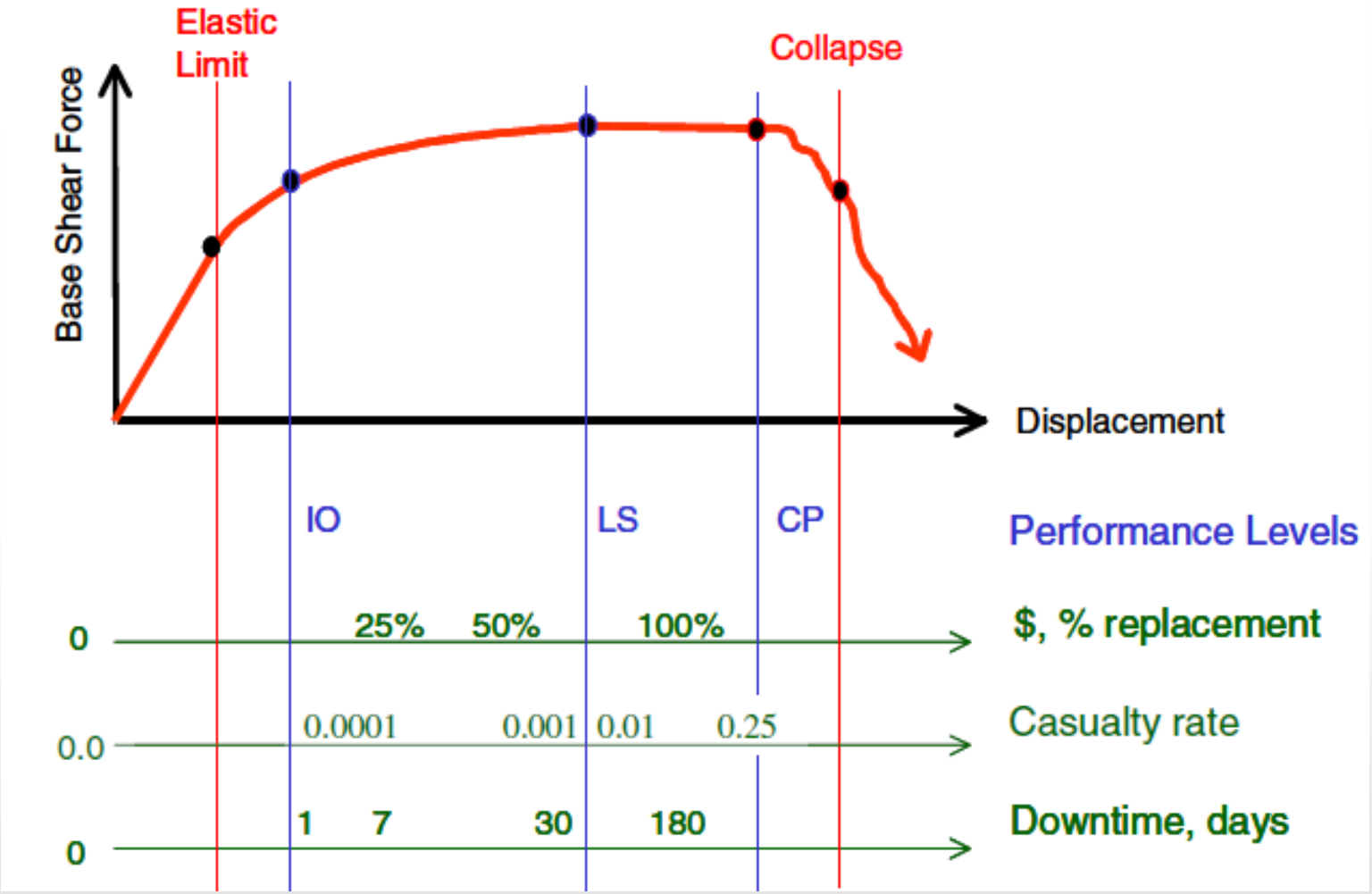
Wave Loads



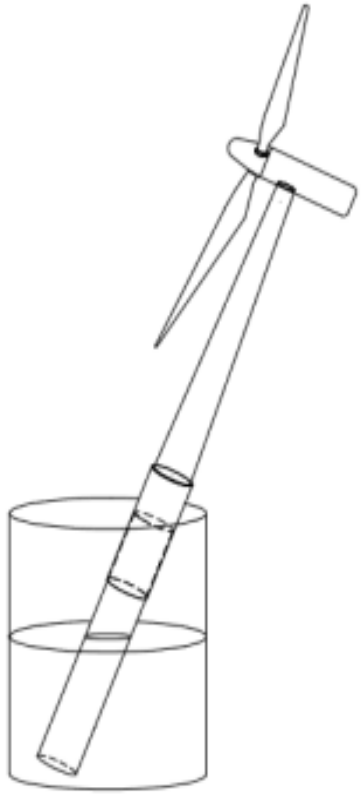
Wind Loads


Earthquake Loads

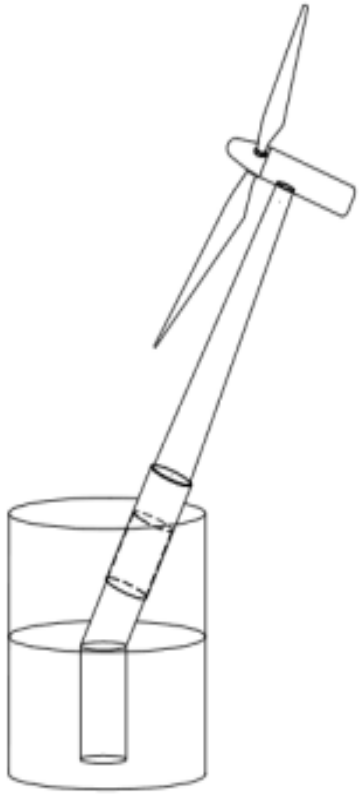
No 2.: Fragility functions definition based on the probability of collapse and the performance levels in accordance with the standard applied performance levels.



No 3.: Application of rotation in the connection section of transient part of tower to the foundation as the structural response utilized for definition of limit states in all levels of loading. (Serviceability Failure)



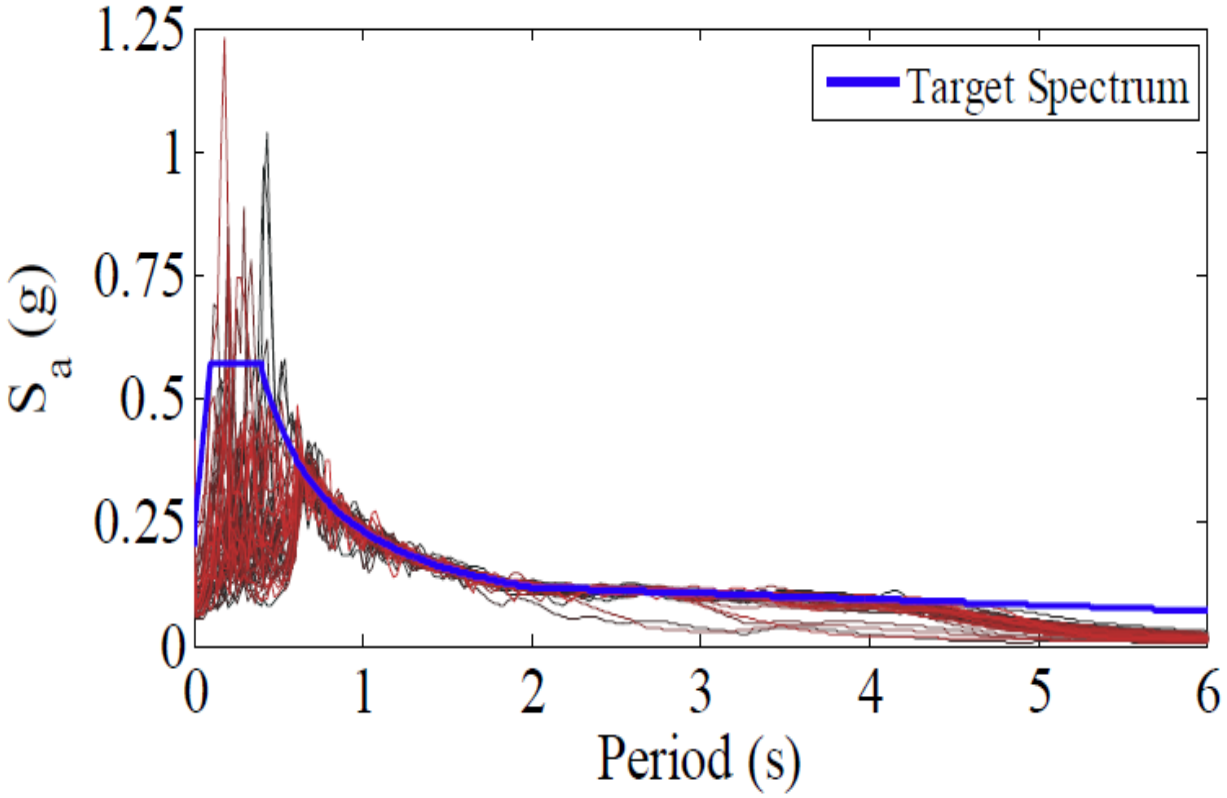
ULS: Failure through exceeding the foundation's ultimate lateral capacity (soil failure)



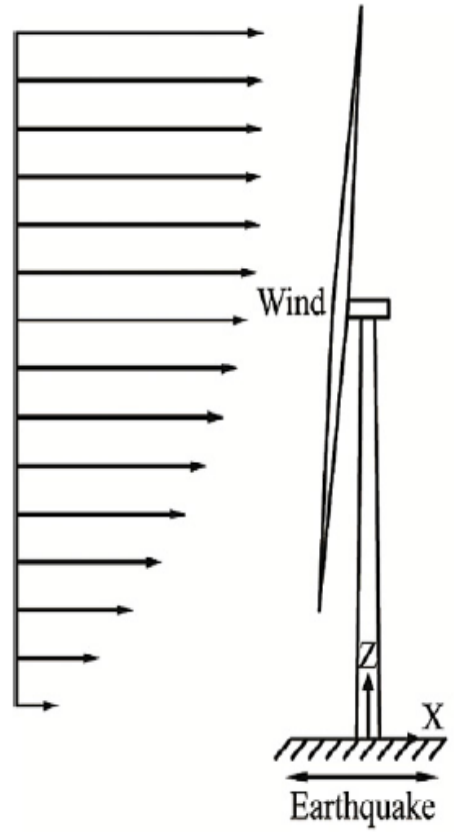
ULS: Failure through plastic hinge of the pile (pile yield failure)

SLS: Tilt angle exceeds allowable value (serviceability failure)

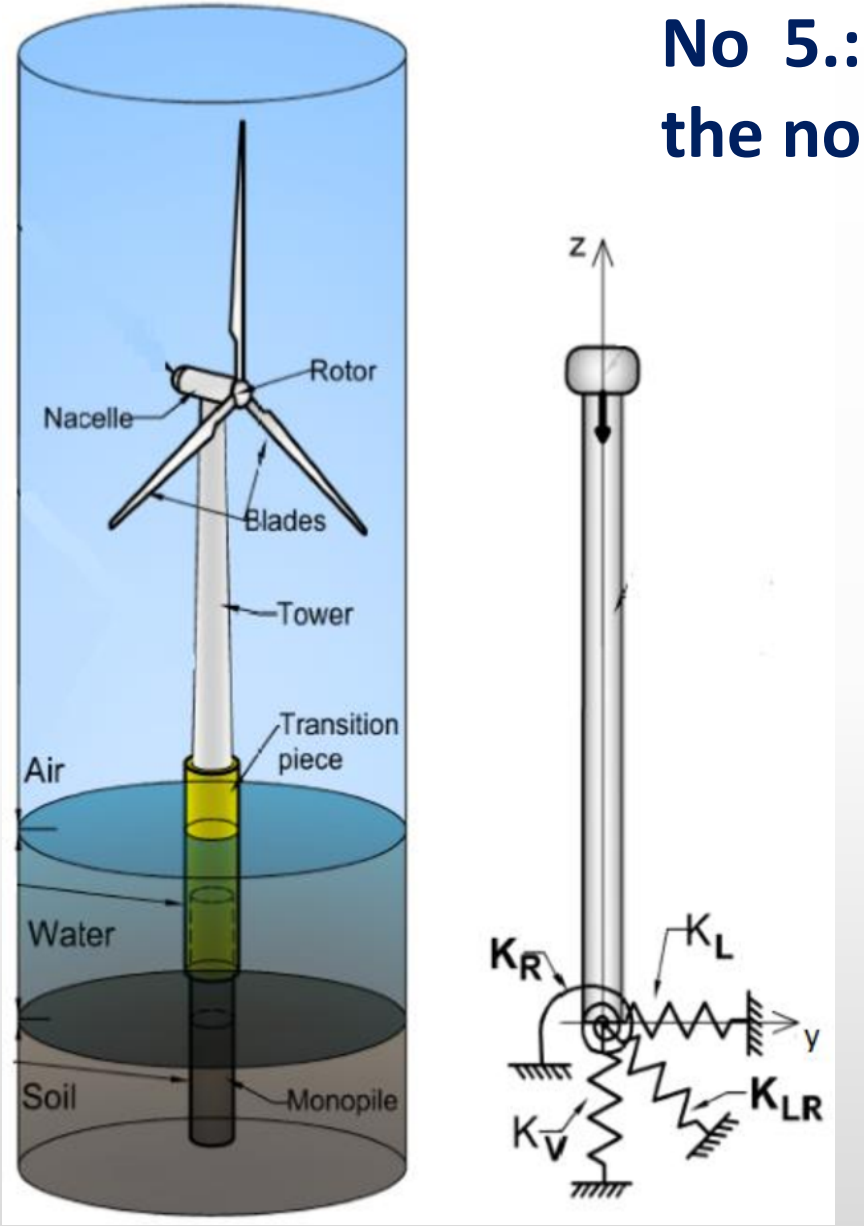
No 4.: Probabilistically consideration of wind and earthquake loads by adjusting the hazard levels of earthquake and wind load.

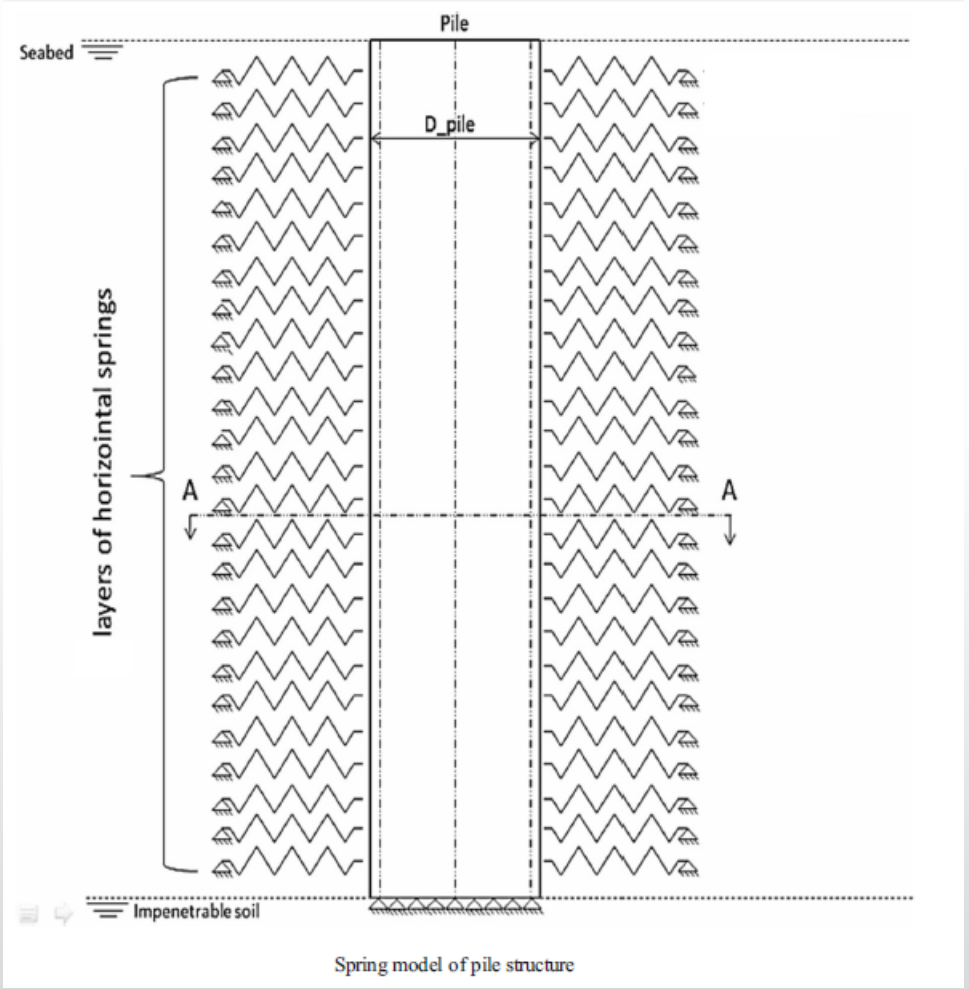


Spectrally matched spectra and target spectrum.



No 5.: Advanced applied techniques for modeling the nonlinearity both in SSI and steel material parts.





Spring model of pile structure

Specification of the model:

Specifications

Rated power: *5 MW*

Rotor orientation and configuration: *Upwind – 3 blades*

Control: *Variable speed, collective pitch*

Drivetrain: *High Speed, multiple-stage gearbox*

Rated wind speed: *11.4 m/s*

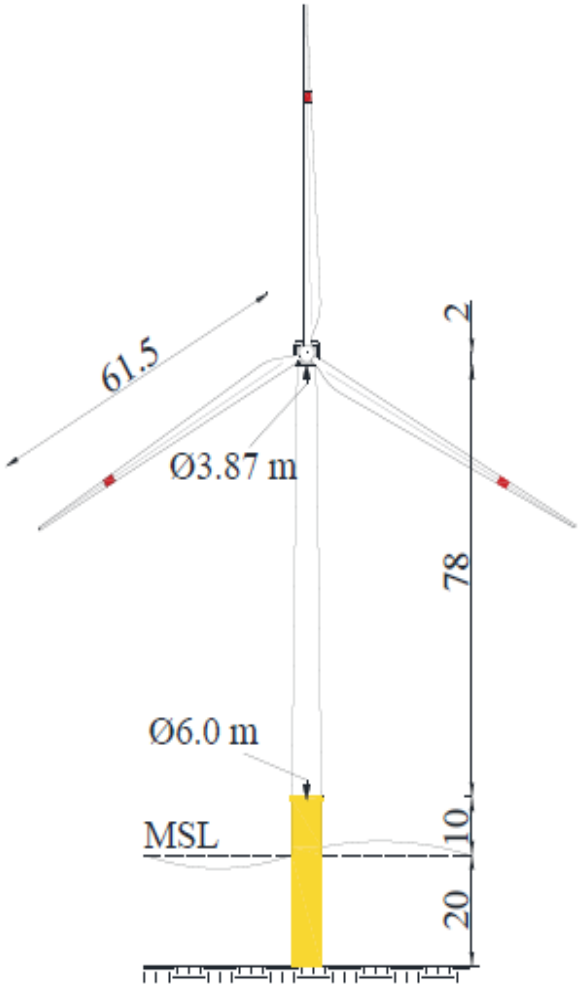
Cut-in wind speed: *3 m/s*

Cut-out wind speed: *25 m/s*

Mass of rotor: *110 t*

Mass of nacelle: *240 t*

Mass of tower & monopile: *522.62 t*



Structural & Material properties

Monopile diameter: *6.0 m*

Monopile thickness: *60.0 mm*

Tower base diameter: *6.0 m*

Tower base thickness: *27.0 mm*

Tower top diameter: *3.87 m*

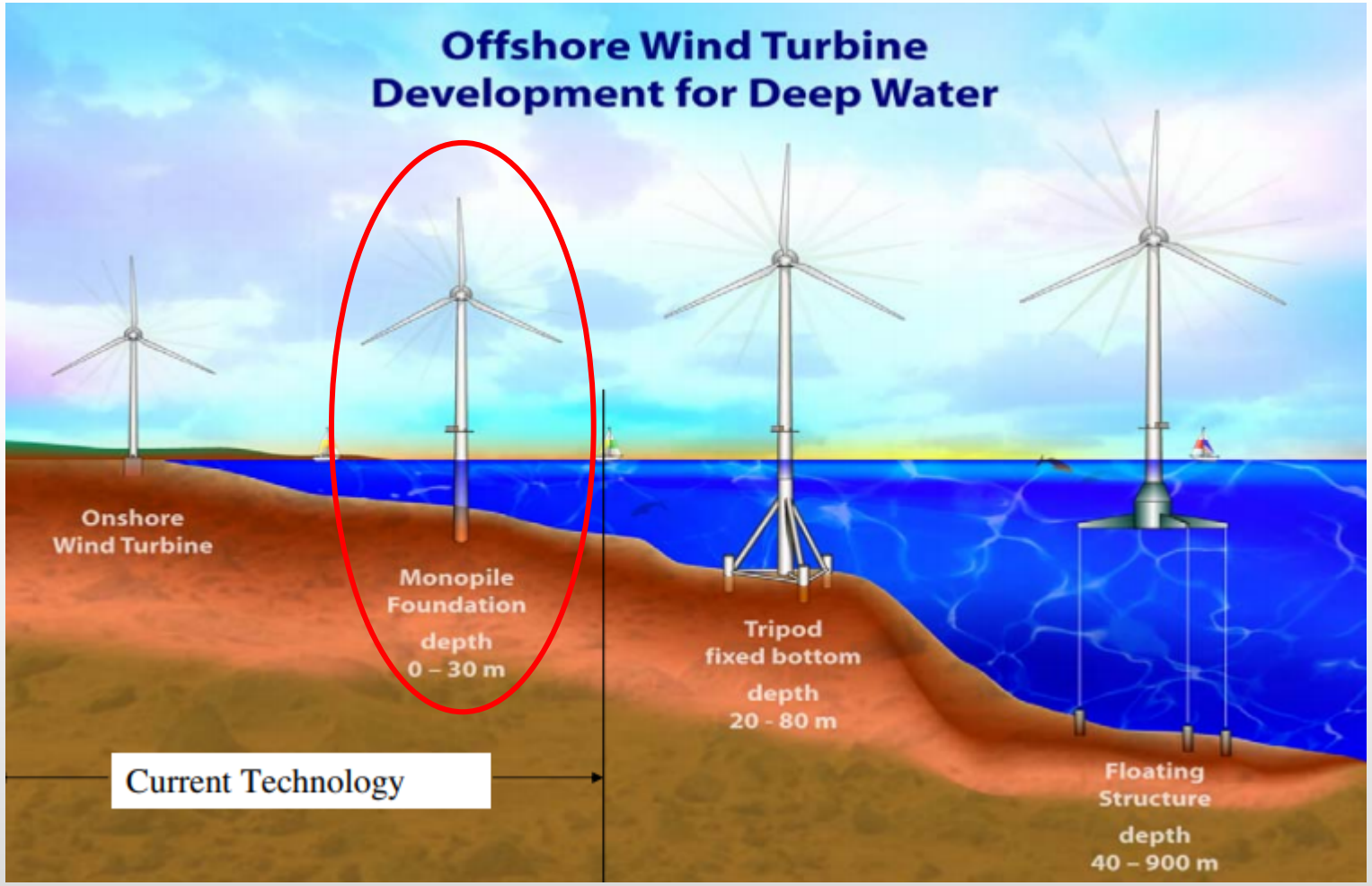
Tower top thickness: *19.0 mm*

Young's Modulus: 210 GPa

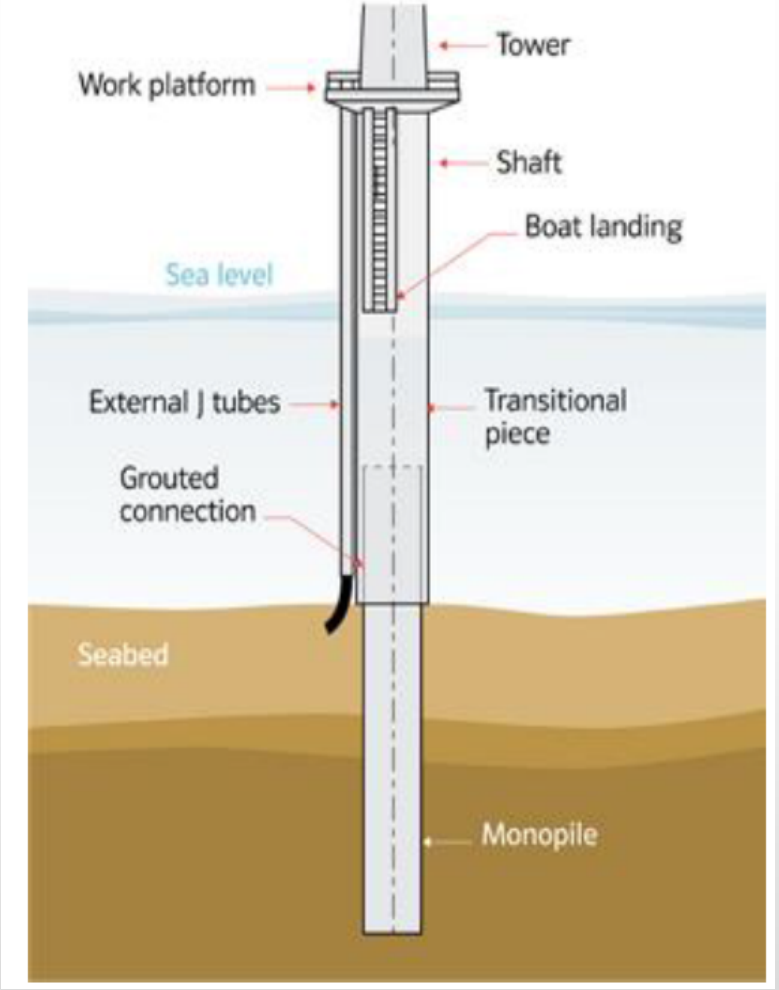
Shear Modulus: *80.8 GPa*

Density: 8.5 (t/m^3)

Specification of the foundation



Monopile foundation is assessed in this research



Expected Results

- Modified fragility curves accounting for soil-structure interaction effects.
- Probabilistically framework of decision making considering simultaneous earthquake, wind and wave loads.
- A computer code model including soil-structure interaction in evaluating structural responses based on the prescribed innovative and comprehend modeling assumptions and techniques formerly discussed in this proposal.
- Consideration of different types of soil and different ground motion characteristics.
- Some benchmark studies.

Group Research/Industrial Projects

Requirement of this research for industrial data:

In this research some practical technical resources are provided from:

- GWEC, Global Wind Energy Outlook, GWEC, (2014).
- Fred. Olsen Wind carrier - Offshore turbine installations manuals.
- Business framework and regulations for Offshore Wind in Germany, DNV GL Company.

Support to industrial projects:

Outcomes could be very supportive for industrial projects in view of:

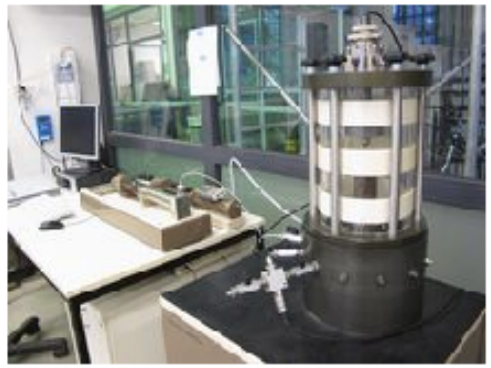
- Construction decision making.
- Allocating initial investment.
- Accurate evaluation of probability of collapse of turbine.
- More realistic estimation of behavior of turbines subjected to earthquakes.

Group Supervised Labs

The research is defined analytically. For some initial data, the laboratory outcomes of TUB could be used. TUB has sets of very advanced laboratories mentioned here.

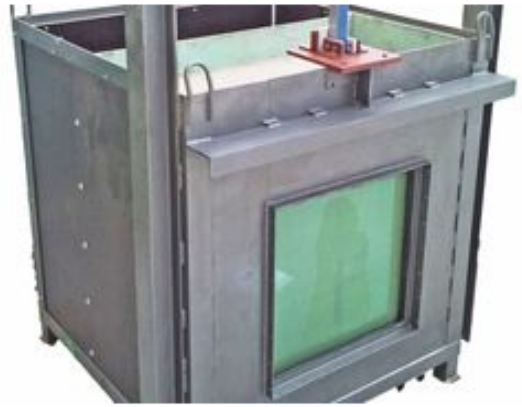

Analysis laboratory (unconsolidated rock)


Soil mechanics laboratory


Soil dynamics laboratory


Large-scale geotechnical test pit


Analysis laboratory (suspension)

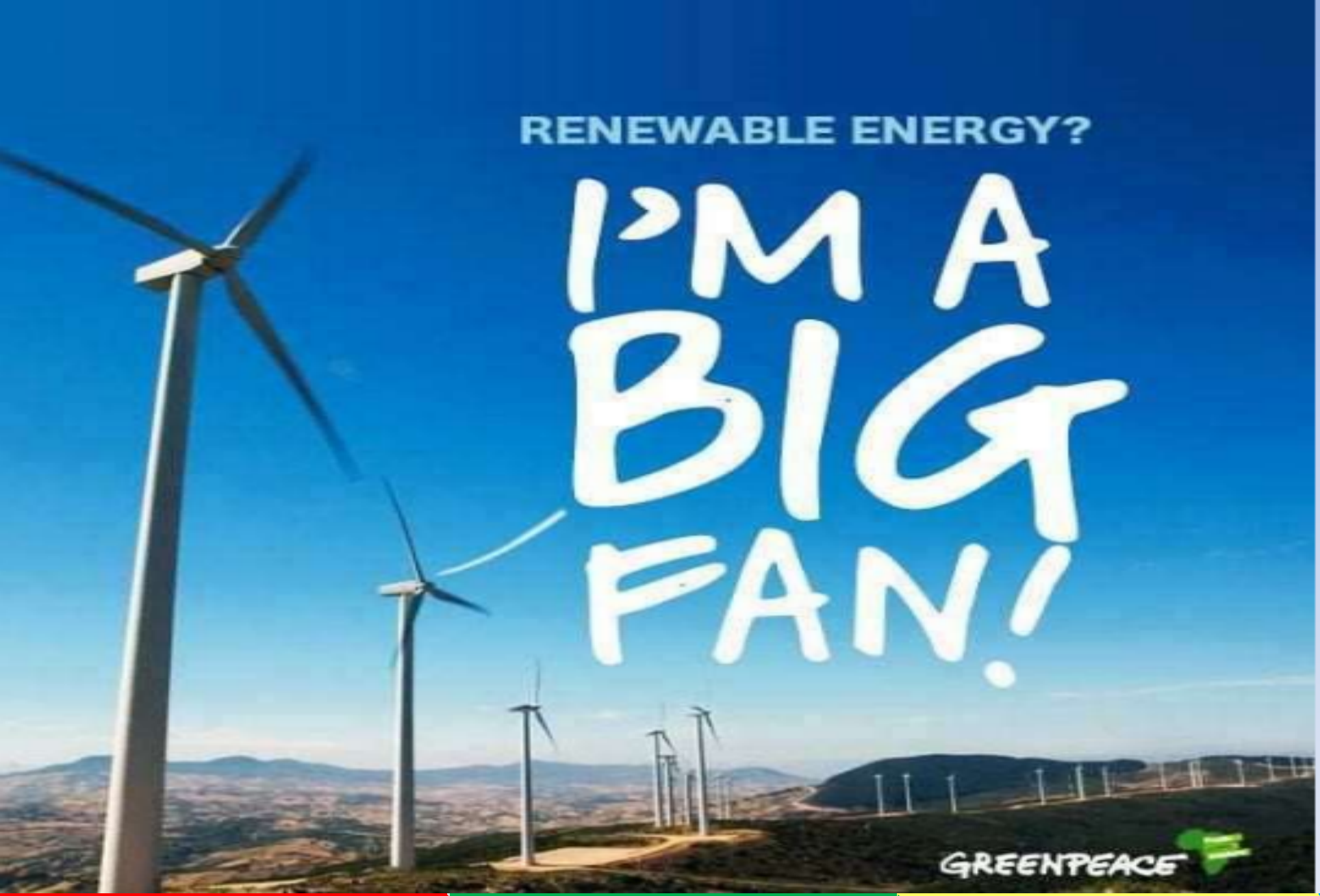

1g model tests

Group Contact Information

Prof. Dr. Ing. Frank Rackwitz
Gustav-Meyer-Allee 25, 13355 Berlin, Tel: +49 30 31472341,
fax: +49 30 31472343, e-mail: frank.rackwitz@tu-berlin.de

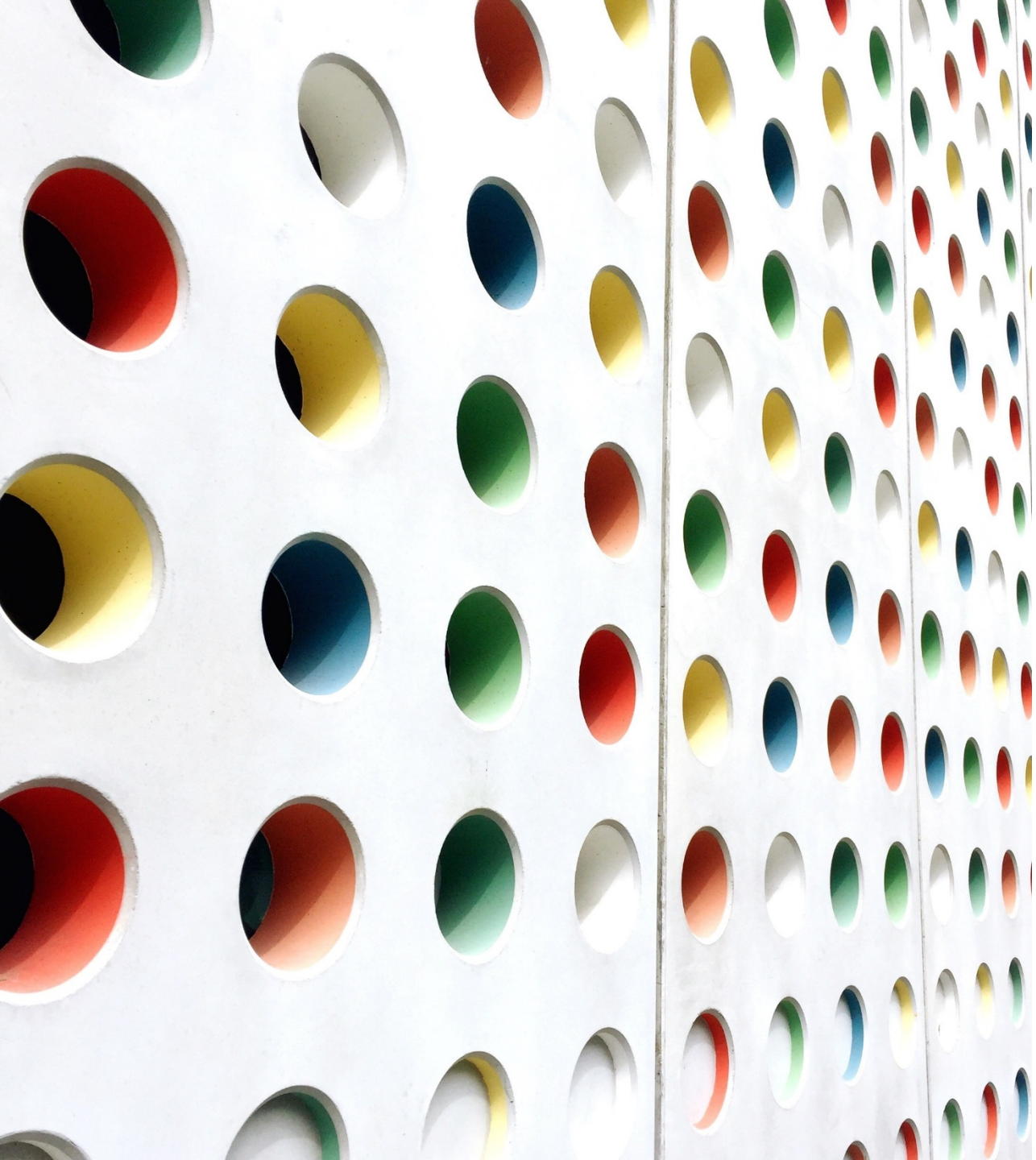
Office: Ms. Nancy Hadzik-Schulz, (Secretary TIB 1-B7)
Gustav-Meyer-Allee 25, 13355 Berlin, Building 13b, 4th floor, room 403
Tel: 030/314 72 341, Fax .: 030/314 72 343, email: nancy.hadzik-schulz@tu-berlin.de

Prof. Leila Haj Najafi
Faculty of Technical and Engineering, Department of Civil and Environmental Engineering, Tel:+989122049302, email: lila_najafi@aut.ac.ir , l_najafi@azad.ac.ir



Thank You

For Your Patience



DFG 2020
BECAUSE RESEARCH MATTERS

Amirkabir University of Technology
(Tehran Polytechnic)

AUT - DFG

Joint Matchmaking Webinar

April 2021

Research Group CV

Members:

1. **Prof. Hamid Zeraatgar**, Faculty of Maritime Engineering, Amirkabir University of Technology
2. **Prof. Mesbah Saybani**, Bandar Abbas Campus, Amirkabir University of Technology
3. **Prof. Morteza Kolahdoozan**, Faculty of Civil and Environmental Engineering, Amirkabir University of Technology
4. **Prof. Mohamad Hossein Ghaemi**, Faculty of Ocean Engineering and Ship Technology, Gdańsk University of Technology
5. **Dr. Mojtaba Barjasteh**, Bandar Abbas Campus, Amirkabir University of Technology

Prof. Hamid Zeraatgar

Faculty of Maritime Engineering
Dean of Faculty
Amirkabir University of Technology

Research Interests:

1. Hydrodynamics
2. Ship Propulsion
3. Experimental Maneuvering

Distinctive Papers:

1. “Analysis of hull, propeller and engine interactions in regular waves by a combination of experiment and simulation”, Journal of Marine Science and Technology, **26**, 2020
2. “A reliable simulation for hydrodynamic performance prediction of surface-piercing propellers using URANS method”, Applied Ocean Research, **92**, 2019
3. “An experimental study on water entry of asymmetric wedges”, Applied Ocean Research, **58**, 2016

Prof. Mesbah Saybani

Bandar Abbas Campus
Dean of Campus
Amirkabir University of Technology

Research Interests:

1. Shipbuilding Technologies
2. Welding Optimization
3. Corrosion and Coating

Distinctive Papers:

1. “Weight and Cost Optimization of Midship Section Using Common Structural Rules”, Journal of Ship Production and Design, **36**, 2020
2. “Using the Bayesian updating approach to develop time-dependent corrosion wastage model for deck panel of bulk carriers”, Marine Structures, **64**, 2019
3. “Corrosion behavior of mild steel in H2SO4 solution with 1, 4-di [1’-methylene-3’-methyl imidazolium bromide]-benzene as an ionic liquid”, Corrosion Science, **107**, 2016

Prof. Morteza Kolahdoozan

Faculty of Civil and Environmental Engineering
Director of Graduate Studies
Amirkabir University of Technology

Research Interests:

1. Sediment transport
2. Multiphase flows
3. Renewable Energy

Distinctive Papers:

1. “Mixed Discrete Least Squares Meshfree method for solving incompressible Navier-stokes equations”, Engineering Analysis with Boundary Element Methods, **88**, 2018
2. “Mesh-free SPH modeling of sediment scouring and flushing”, Computers & Fluids, **129**, 2016
3. “On the criteria for the Initiation of motion in tidal inlets: deterministic and stochastic approaches”, Coastal Engineering, **58**, 2011

Prof. Mohamad Hossein Ghaemi

Faculty of Ocean Engineering and Ship Technology
Vice-Dean for Education
Gdańsk University of Technology

GDAŃSK UNIVERSITY OF TECHNOLOGY

Research Interests:

1. Modeling, simulation, optimization and control of ship propulsion systems
2. Green shipping and ship energy efficiency
3. Biobearings and bioceramics

Distinctive Papers:

1. "Analysis of hull, propeller and engine interactions in regular waves by a combination of experiment and simulation", Journal Of Marine Science And Technology, **26**, 2020
2. "High performance super-twisting sliding mode control for a maritime autonomous surface ship (MASS) using ADP-Based adaptive gains and time delay estimation", Ocean Engineering, **191**, 2019
3. "Zirconia ceramics with additions of Alumina for advanced tribological and biomedical applications", Ceramics International, **43**, 2017

Dr. Mojtaba Barjasteh

Bandar Abbas Campus

Amirkabir University of Technology

Research Interests:

1. Stokes flows
2. Mathematical Hydrodynamics
3. Boundary Element Method

Distinctive Papers:

1. “Numerical simulation of cushioning problem for blunt bodies using boundary element method”, Polish Maritime Research, **25**, 2018
2. “Numerical Evaluation of Cushioning Pressure in Water Entry of Rigid Bodies”, International Journal of Maritime Technology, **8**, 2017
3. “An experimental study on water entry of asymmetric wedges”, Applied Ocean Research, **58**, 2016

Research Group Interest


Innovative Propulsion Technology


Modern Maritime Transportation


Novel Marine Renewable Energy


Experimental Hydrodynamics


Ship Drag Reduction


Coastal Floating Structures


Intelligent Shipbuilding Technologies

Group Research/Industrial Projects

1. Drag Reduction Using Air Bubble Injection
2. Optimization of Engine-propeller Control System
3. Multistage Floating Breakwaters
4. Architecture of New Passenger Ships
5. Autonomous Ship Transportation
6. Reducing Gas Emissions in Maritime Transport

Group Supervised Labs

Laboratory of Hydrodynamics

Laboratory of Hydrostatics

Laboratory of Hydraulics

Laboratory of Erosion & Corrosion

Workshop of Composite Structure

Laboratory of Fluid Mechanics

Towing Tank (Joint-Program)

Group Contact Information

Member	Email
Prof. Hamid Zeraatgar	hamidz@aut.ac.ir
Prof. Mesbah Saybani	msaybani@aut.ac.ir
Prof. Morteza Kolahdoozan	mklhdzan@aut.ac.ir
Prof. Mohamad Hossein Ghaemi	ghaemi@pg.edu.pl
Dr. Mojtaba Barjasteh	barjasteh@aut.ac.ir