

# Eldrich Rebello

P.ENG · ELECTRICAL ENGINEER - RENEWABLE ENERGY, SMART GRID

Guelph, ON

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## Experience

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### Natural Resources Canada

Guelph, Ontario, Canada 🇨🇦

SCIENCE AND TECHNOLOGY ADVISOR - OFFICE OF ENERGY RESEARCH & DEVELOPMENT

October 2022 – Present

- Senior advisor on the Smart Grid and Renewable Energy team. Provide specialised technical advice on smart grid technologies, renewable energy technology and distribution grid modernization. Role includes developing an understanding of the relationship between economic regulation, technical standards and desired goals for the electricity sector.
- Leading program renewal for the smart grid program. Responsible for design of program technical scope.
- Project supervision for existing projects including technical review. Responsible for technical review and support on Government project grants including energy system topics. More information available on request.
- Supervising the work of team members, interpreting project results and presenting these to government colleagues. Liaising with the private sector, research institutes and other industry stakeholders.

### Wind Energy Inst. of Canada

Prince Edward Island, Canada 🇨🇦

GRID INTEGRATION ENGINEER - SUPERVISING TWO JUNIOR ENGINEERS

August 2017 – August 2022

- Sole technical responsibility for a variety of government- & industry-funded applied research projects focused on practical grid integration issues & solutions for MW-scale wind turbines, solar PV and battery storage.
- Combined solar PV and battery storage project - Owner's engineer - project management from RFP through to commissioning and operation.
- Wrote project proposals & detailed progress reports, conducted literature surveys, planned, coordinated & performed on-site testing activities, wrote & debugged analysis code, analysed results & performed calculations, wrote academic papers
- Used Python & Excel for extensive data analysis & calculations in projects such as providing secondary frequency regulation from wind farms, testing operation of a battery storage system paralleled with a wind turbine and wind farm data reporting (NERC GADS)
- Additional responsibilities include wind turbine troubleshooting, wind farm data analysis, retrofit designs & presenting research work at wind energy conferences (WindEurope, CanREA, IEEE)
- Project supervision and technical review of NRCan's Canadian Grid Code Study (linked here). Technical analysis, review and presentation of demonstration project with Nova Scotia Power and Enercon Canada (report linked here)

### EWT Direct Wind bv

Amersfoort, The Netherlands 🇳🇱

ELECTRICAL ENGINEER

January 2015 – June 2017

- Main responsibilities - performing & reporting power quality studies (harmonics), grid code compliance analysis & developing turbine electrical simulation models in PowerFactory
- Performed sound power measurements & reported acoustic performance; customer noise complaints & compliance issues
- Developed a retrofit for electrical yaw system & deployed across existing turbine fleet to reduce main bearing failures, Electrical design & equipment selection & layout for design improvement & new development projects such as satellite internet system, PLC-based park controller, selecting & programming protection relays
- Additional responsibilities include discussions with grid operators, commissioning & sales support for electrical systems, turbine feature documentation

### KTH Royal Institute of Technology

Stockholm, Sweden 🇸🇪

MASTERS THESIS WORKER AND GRADUATE RESEARCHER

September 2013 – November 2014

- Hardware based, real-time implementation of Wide area Power oscillation damping control system using PMU data
- Wrote code from scratch to run on NI cRIO FPGA platform and developed hardware-in-the-loop test with an OPAL RT simulator. Used LabVIEW, Matlab & SIMULINK | Worked with Dr. Luigi Vanfretti | Thesis available online.

### Larsen & Toubro Power Limited

Vadodara, India 🇮🇳

EXECUTIVE ENGINEER

September 2009 – May 2012

- Low-voltage electrical systems of a gas-fired power station - Single-point responsibility for EPC life-cycle viz. engineering, commissioning, testing & operation of US\$10 million of equipment including switchgear, distribution transformers, DC and UPS systems

## Education

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### Aalto University (Helsinki Uni. of Technology) - M.Sc in Electrical Engineering

Espoo, Finland

### Mumbai University - B.E in Electrical Engineering

Mumbai, India

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## Skills & Certifications

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- **Software:** General purpose Python scripting, MATLAB Scripting & Simulink - SimPowerSystems • LabVIEW - Real-time & FPGA; Basic Experience: PowerFactory • Eplan P8 Microsoft Office • Git
- **Hardware:** NI cRIO Real-time controllers • eMEGASIM OPAL RT Real Time Simulator • Fluke Power Quality Analysers • Hobby Interest: RaspberryPi, Arduino.
- **Certificates:** Professional Engineer - Ontario • Working & rescue at heights - European & Canadian Norms • First aid

## Publications - Peer-reviewed

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|------|---|----------------------------------|
| 2023 | <b>Fast-frequency response from wind generators–Empirical data from a Type 4 wind farm,</b><br>Eldrich Rebello, Marianne Rodgers, David Stanford, Markus Fischer, Mouhcine Akki             | <i>IEEE</i>                      |
| 2022 | <b>Development of a NARX State-of-Charge Predictor based on Active Power Demand,</b> Alexander Crain, Eldrich Rebello, Adam Sherwood, Darren Jang   | <i>IEEE</i>                      |
| 2020 | <b>Ancillary services from wind turbines: automatic generation control (AGC) from a single Type 4 turbine,</b> Eldrich Rebello, David Watson & Marianne Rodgers                             | <i>Wind Energy Science</i>       |
| 2019 | <b>Experimental Testing of a Real-Time Implementation of a PMU-based Wide-Area Damping Control System,</b> Eldrich Rebello, Dr. Luigi Vanfretti & Mh. Shoaib Almas                          | <i>IEEE Access</i>               |
| 2019 | <b>Developing, implementing &amp; testing up and down regulation to provide AGC from a 10 MW wind farm during varying wind conditions,</b> Eldrich Rebello, David Watson & Marianne Rodgers | <i>IOP Science</i>               |
| 2018 | <b>Performance analysis of a 10 MW wind farm in providing secondary frequency regulation,</b> Eldrich Rebello, David Watson & Marianne Rodgers  | <i>IEEE</i>                      |
| 2018 | <b>Demand and energy avoidance by a 2 MWh energy storage system in a 10 MW wind farm ,</b> David Watson, Eldrich Rebello, Nanae Kii, Thomas Fincker & Marianne Rodgers                      | <i>Journal of Energy Storage</i> |

## Courses & Continuing Education

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|------|---|----------------|
| 2017 | <b>Photovoltaics and the Renewable Electricity Grid,</b> Uni. Freiburg   Fraunhofer ISE | <i>Germany</i> |
| 2015 | <b>Power Quality,</b> EA Technology   | <i>England</i> |
| 2013 | <b>Summer School : Siemens Wind Power,</b> Aarhus University                            | <i>Denmark</i> |