# Newsletter 8

## Understanding stray currents in wind turbine drivetrains

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## Understanding stray currents in wind turbine drivetrains

In Task 4.6, we collect and analyse the results from all WP4 tests on wind turbine drivetrain components. Some of these tests have already been completed, while others are still running or being prepared. At this stage, the main focus is on systematic data collection and building a common picture of how and why drivetrain parts fail earlier than expected.

A key question is whether selected components of the wind turbine powertrain can be remanufactured and reused. In practice, the predicted lifetimes of gears and bearings based solely on mechanical wear are often not achieved. One important suspect is stray electrical current – unwanted current that can pass through bearings and gears because the turbine is connected to a generator. This effect is known in industry, but it is still not very well understood.

To study this, LUT in collaboration with Flenders Finalnd Oy is developing detailed drivetrain models that combine mechanical components (gears, shafts, bearings) with the physics of the lubricating oil film. Electrical characteristics of the elements (such as resistance and capacitance) and oil properties (such as film thickness) are used to estimate where stray currents occur and their magnitudes and frequencies.

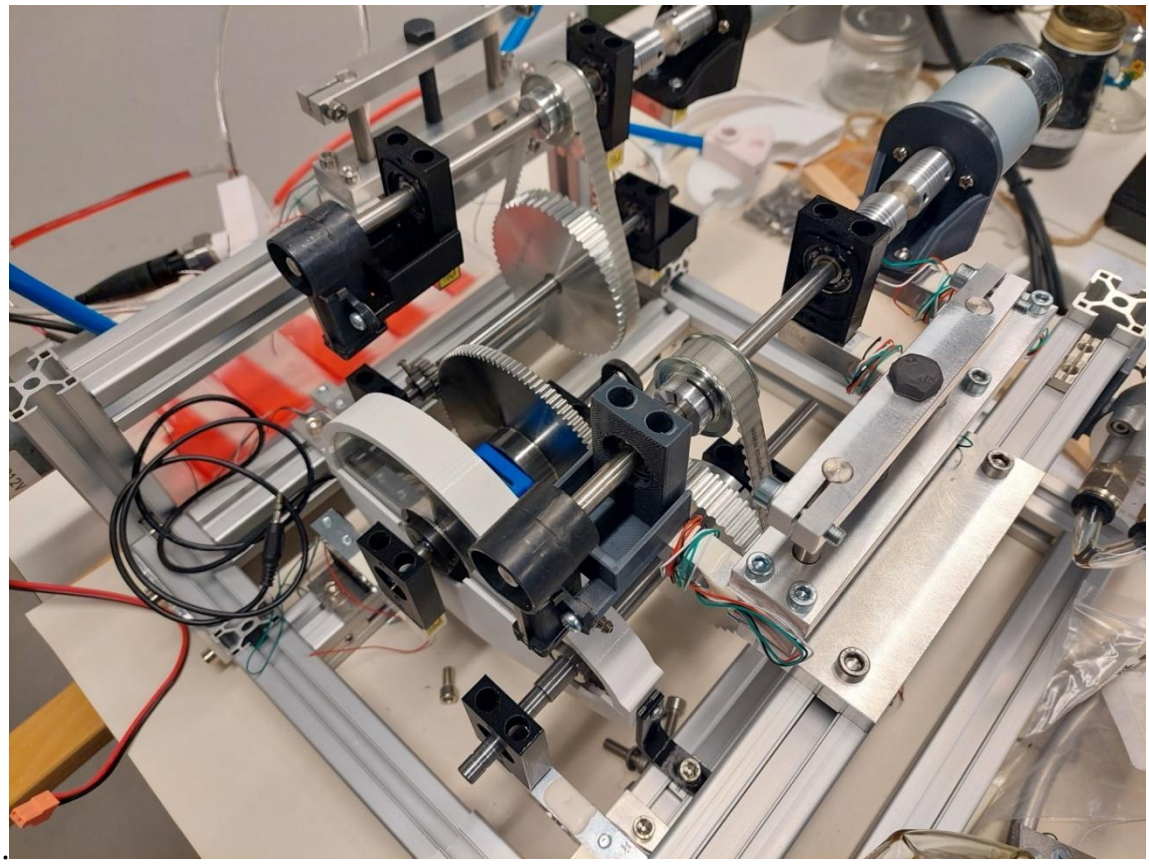

Figure 1- Small-scale drivetrain test rig at LUT used to study stray currents in wind turbine gearboxes.

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