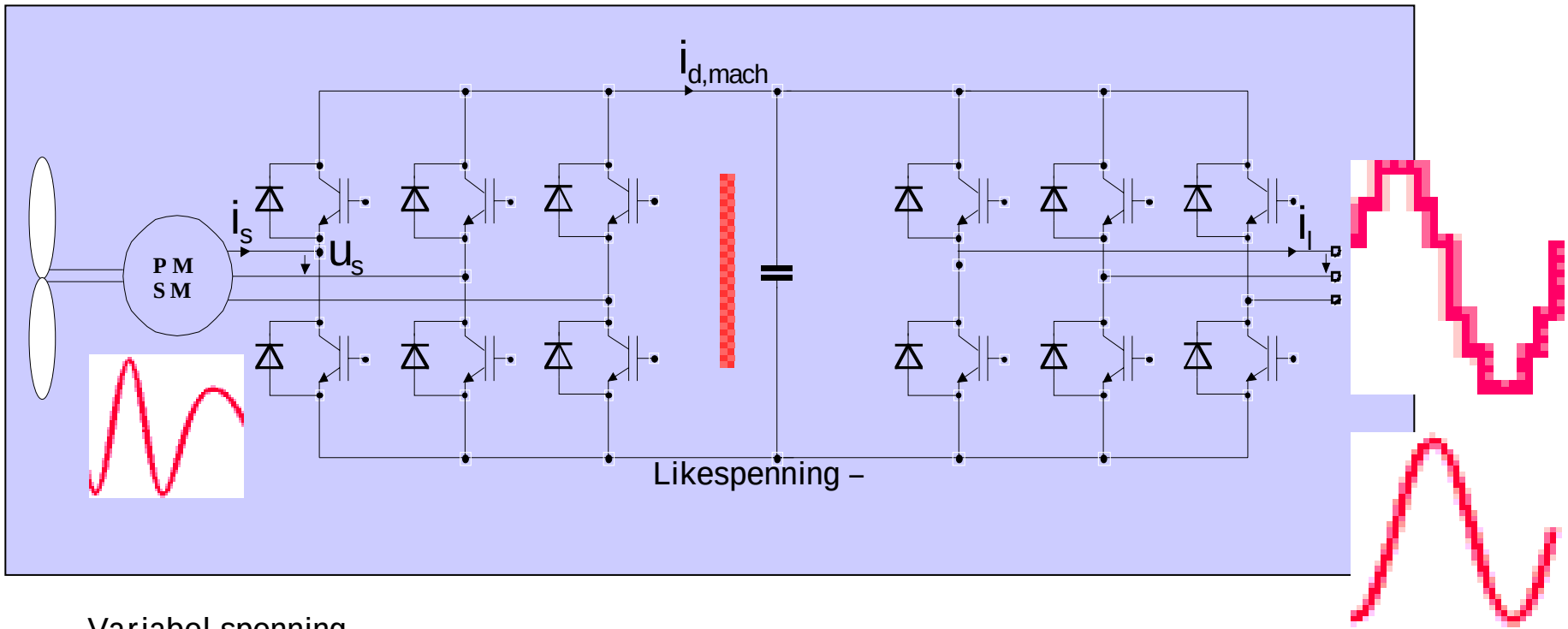
EBL-project: Weight reduced windgenerator systems

A project that focus on future direct driven generator systems for wind power.

Partly financed by Forskningsrådets RENERGI-program

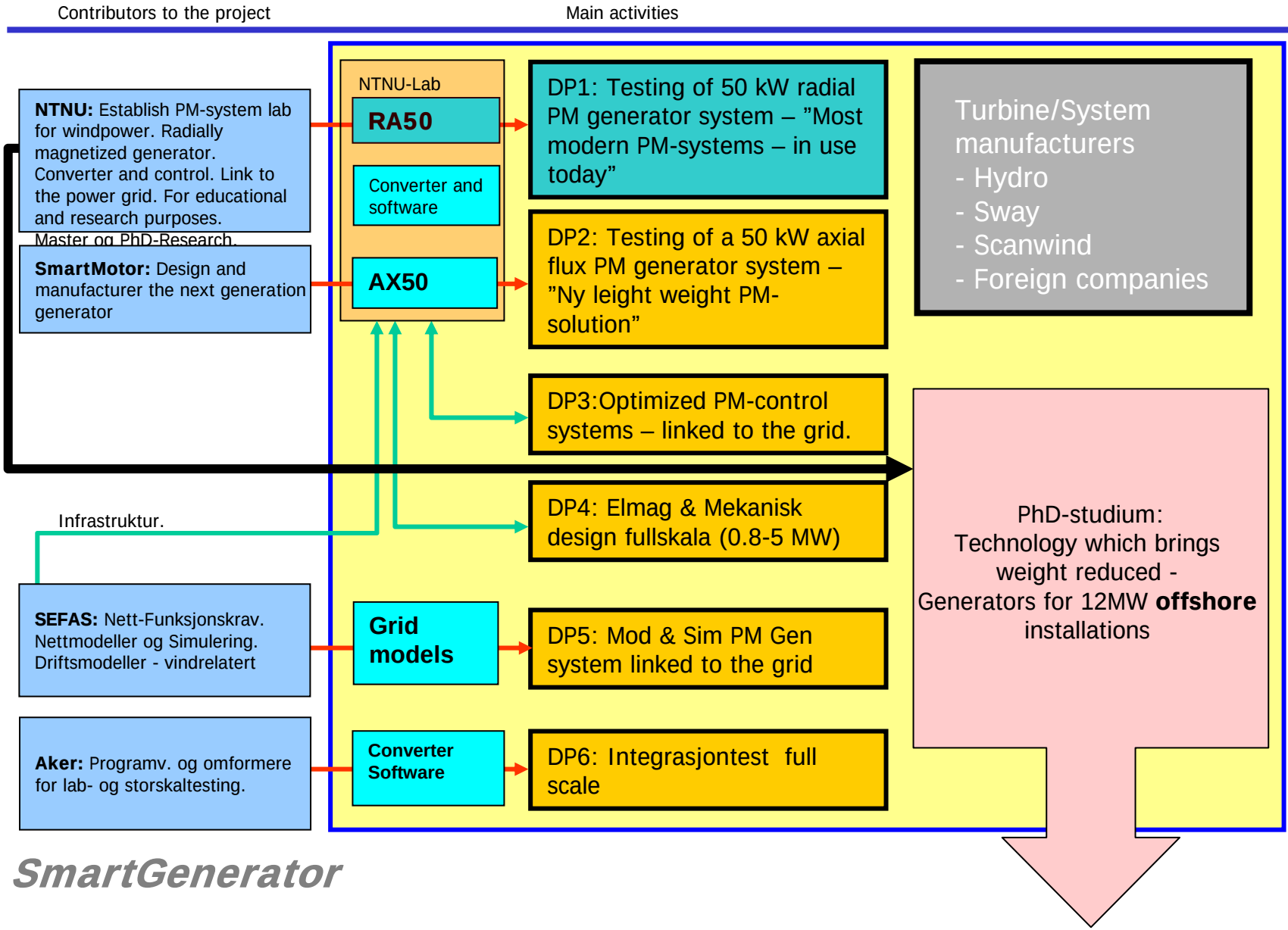
Directdriven Generatorsystems with variable speed turbines



Variabel spenning
- på grunn av variabelt turtall

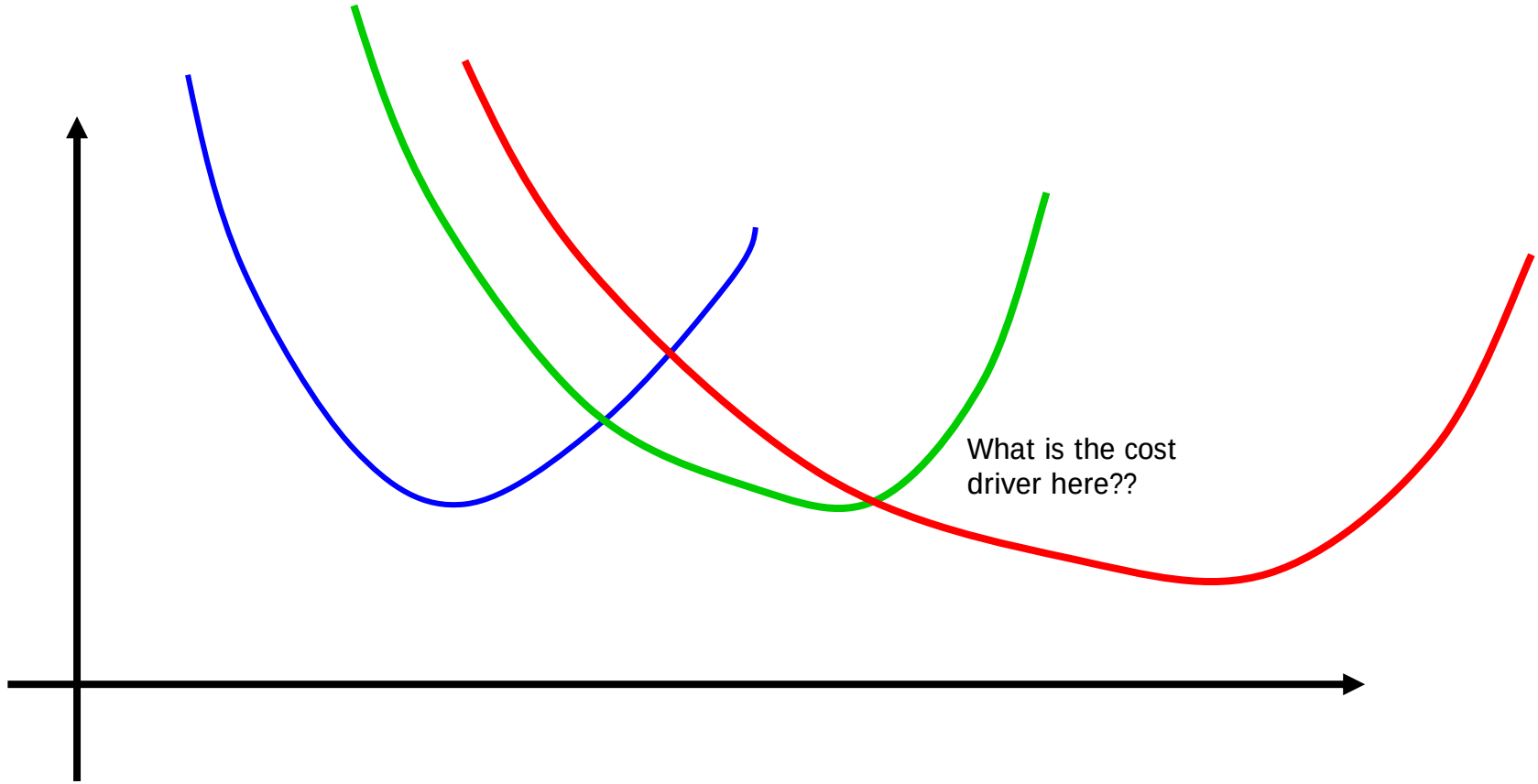
Vekselspenning mot nett
- med fast amplitude og frekvens

Main activities and results – EBL-project.



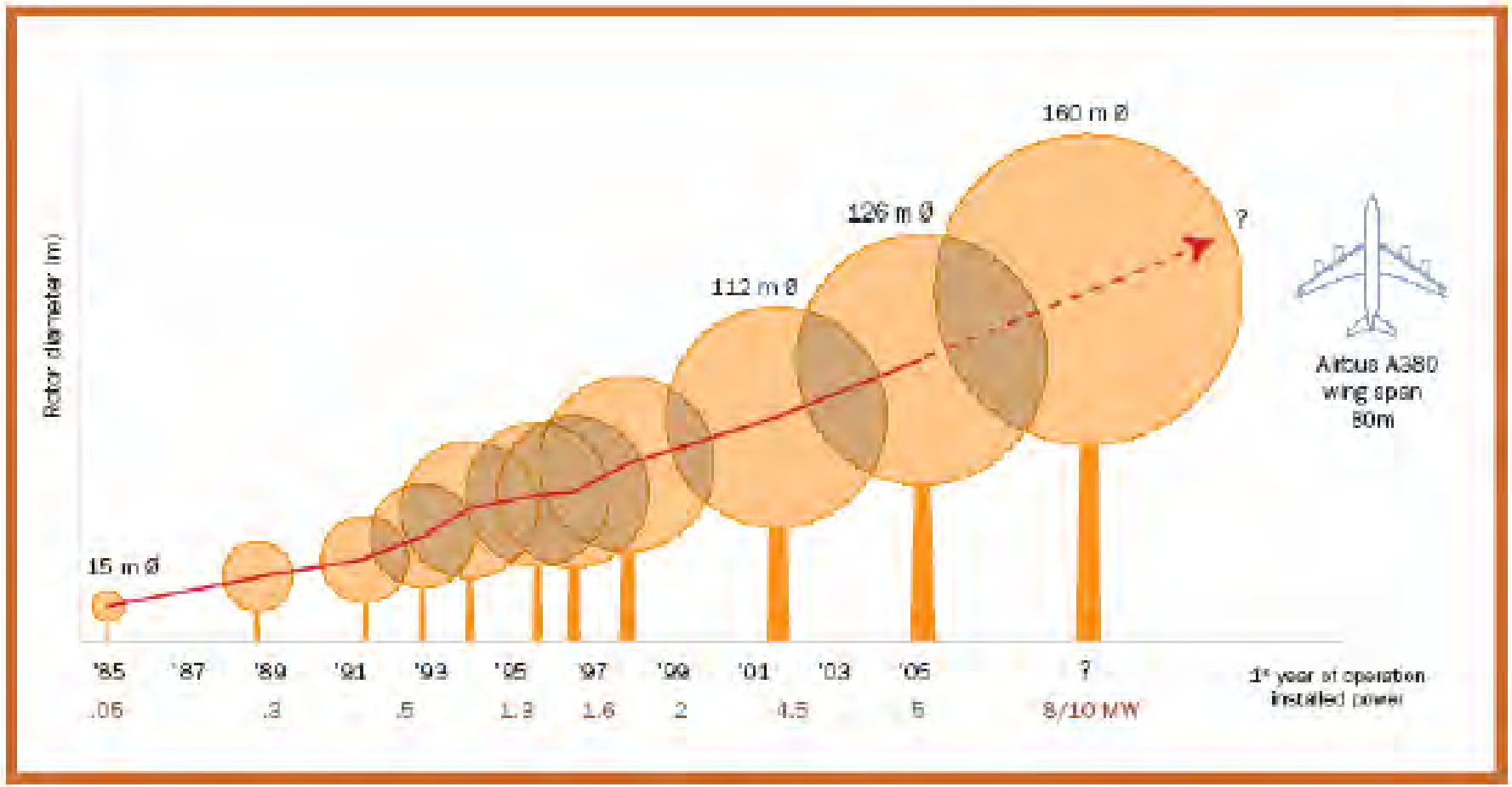
PhD-study:
Technology that brings weight reduced generator systems offshore and up to 12MWatt.

Cost development onshore and offshore

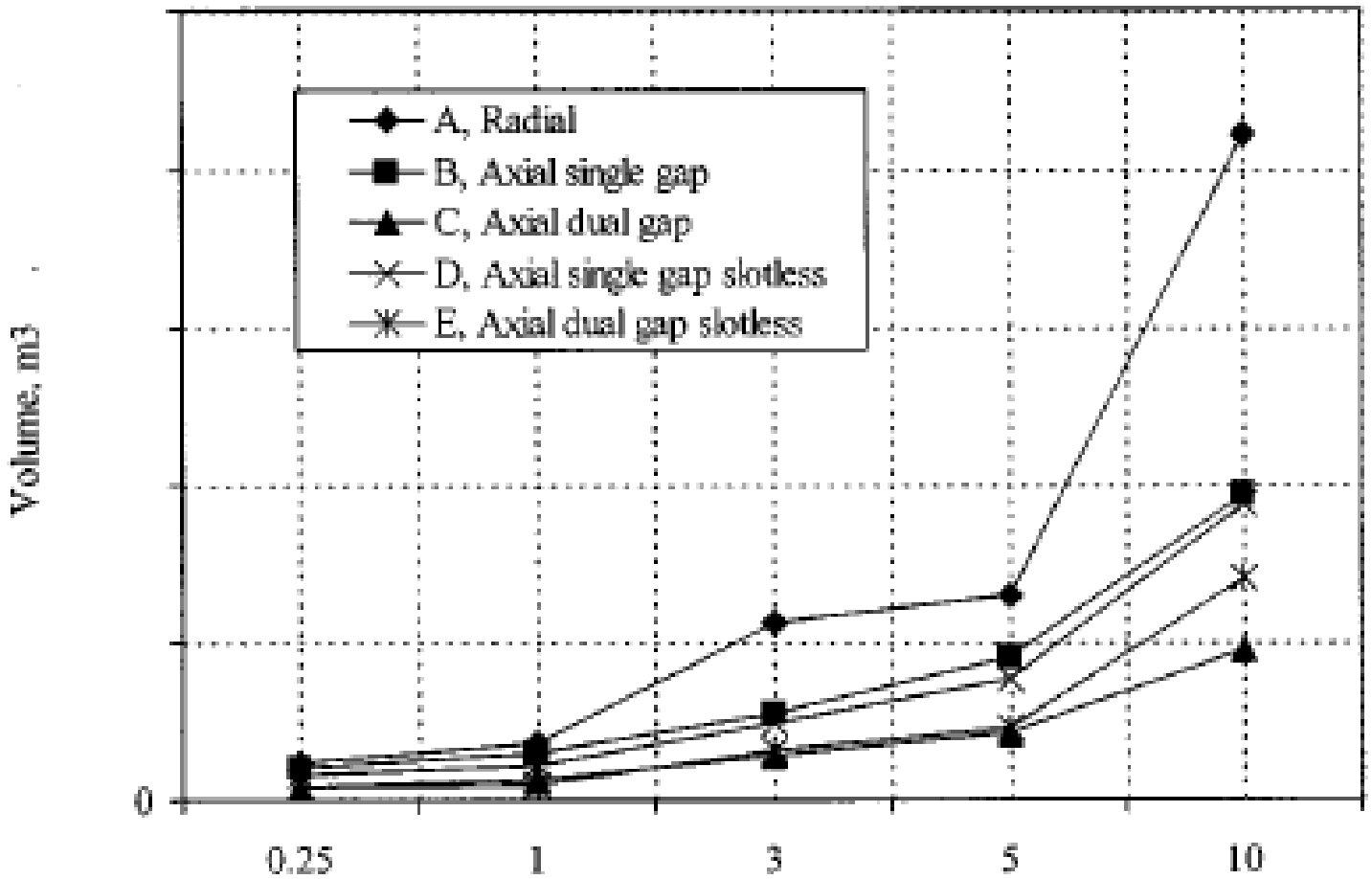


SmartGenerator

Rappid technology development

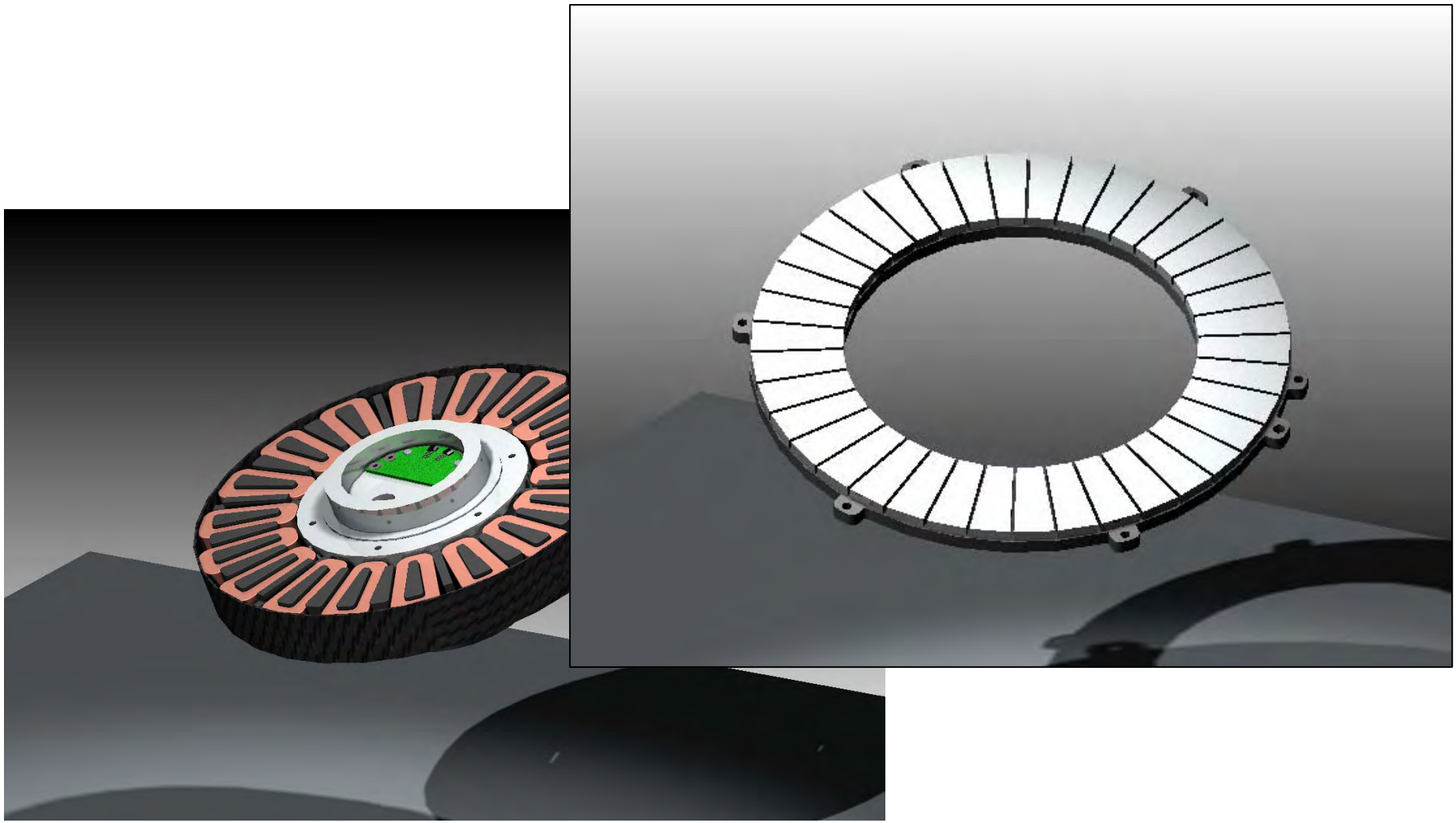


Expectation for the new technology



Axiall magnetized ironless machines

- high torque and a small volume



SmartGenerator

New toroidal – ironless machines seems to come

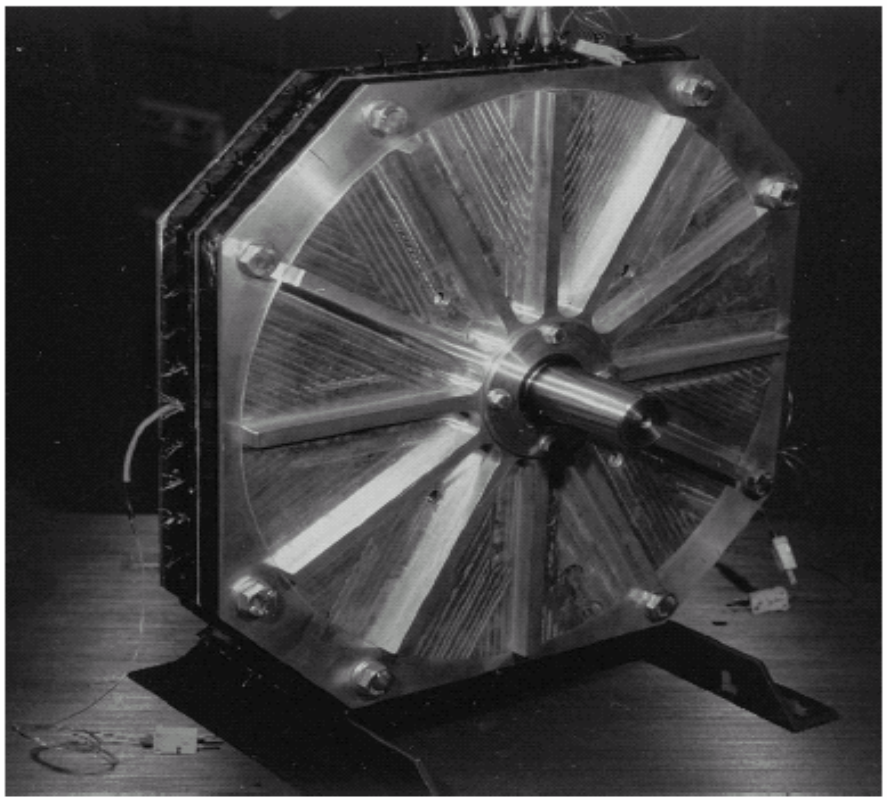


Fig. 3. Machine prototype rated 70 kW at 3000 r/min.

Key figures:

Speed 3000

Diameter 40cm

Length: 5cm

Weight 40kg

Water cooled

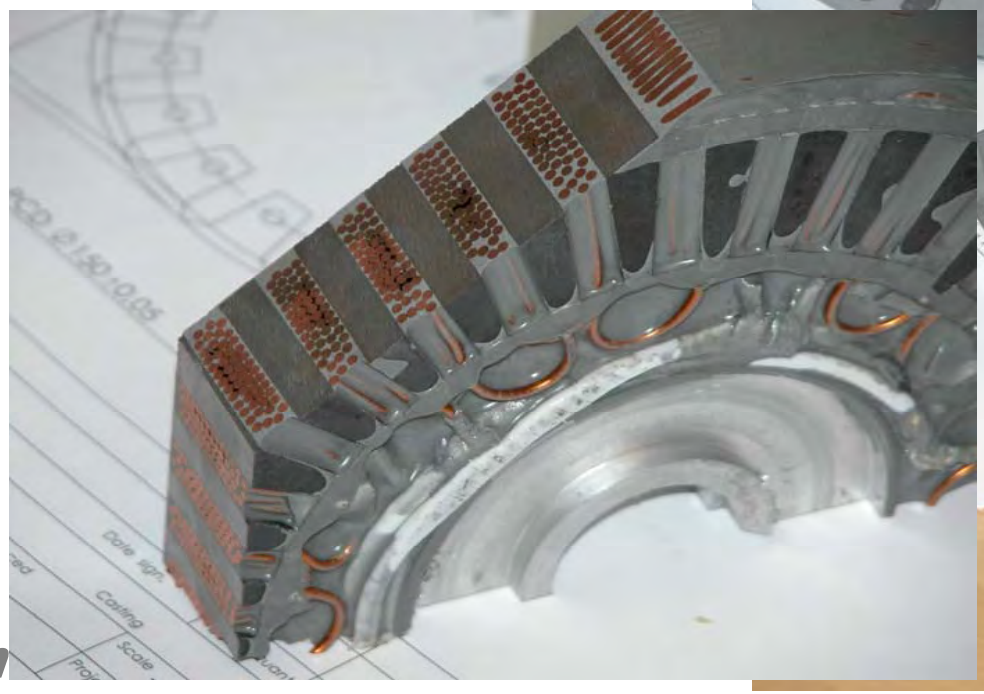
Max torque 460Nm

Aver. torque 230Nm

Power 70kW

Frequency 400

Axial motor stators





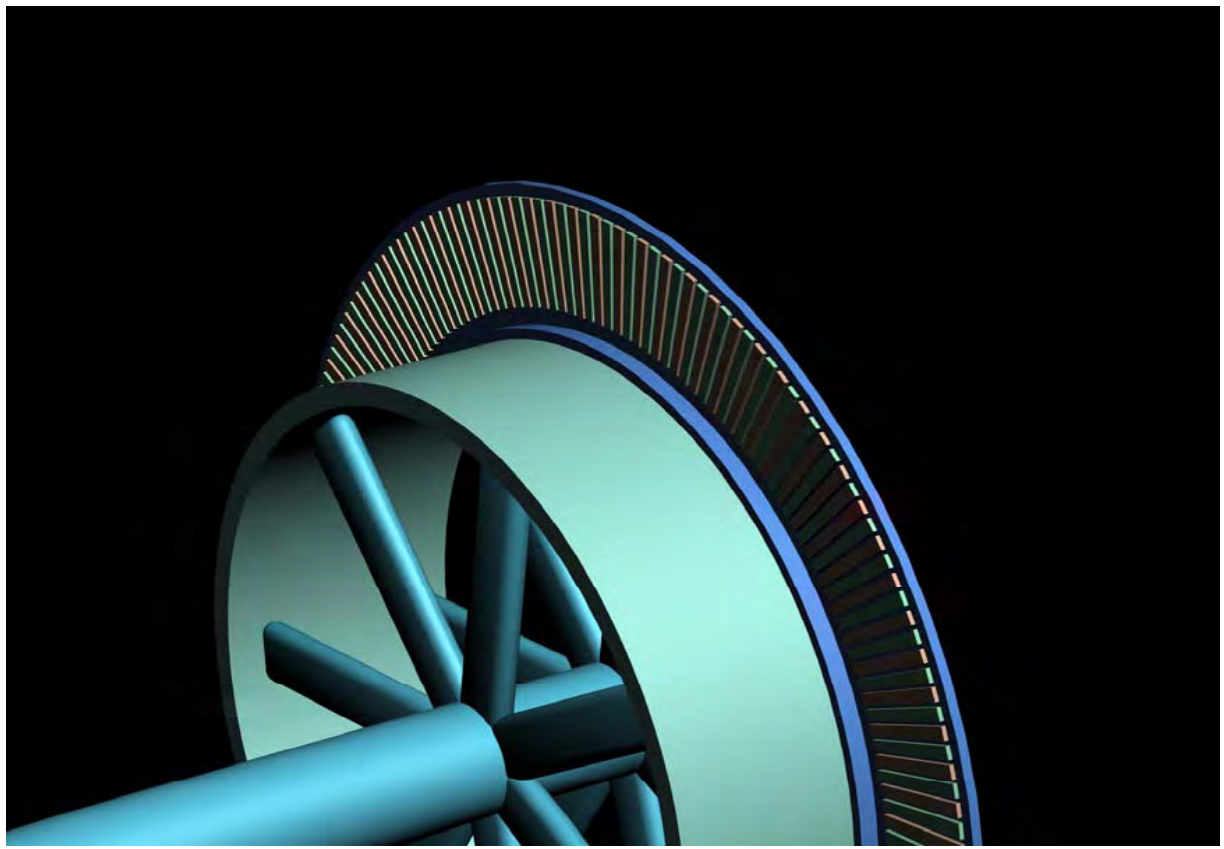
Multidisc machines – the future high torque motor??!!



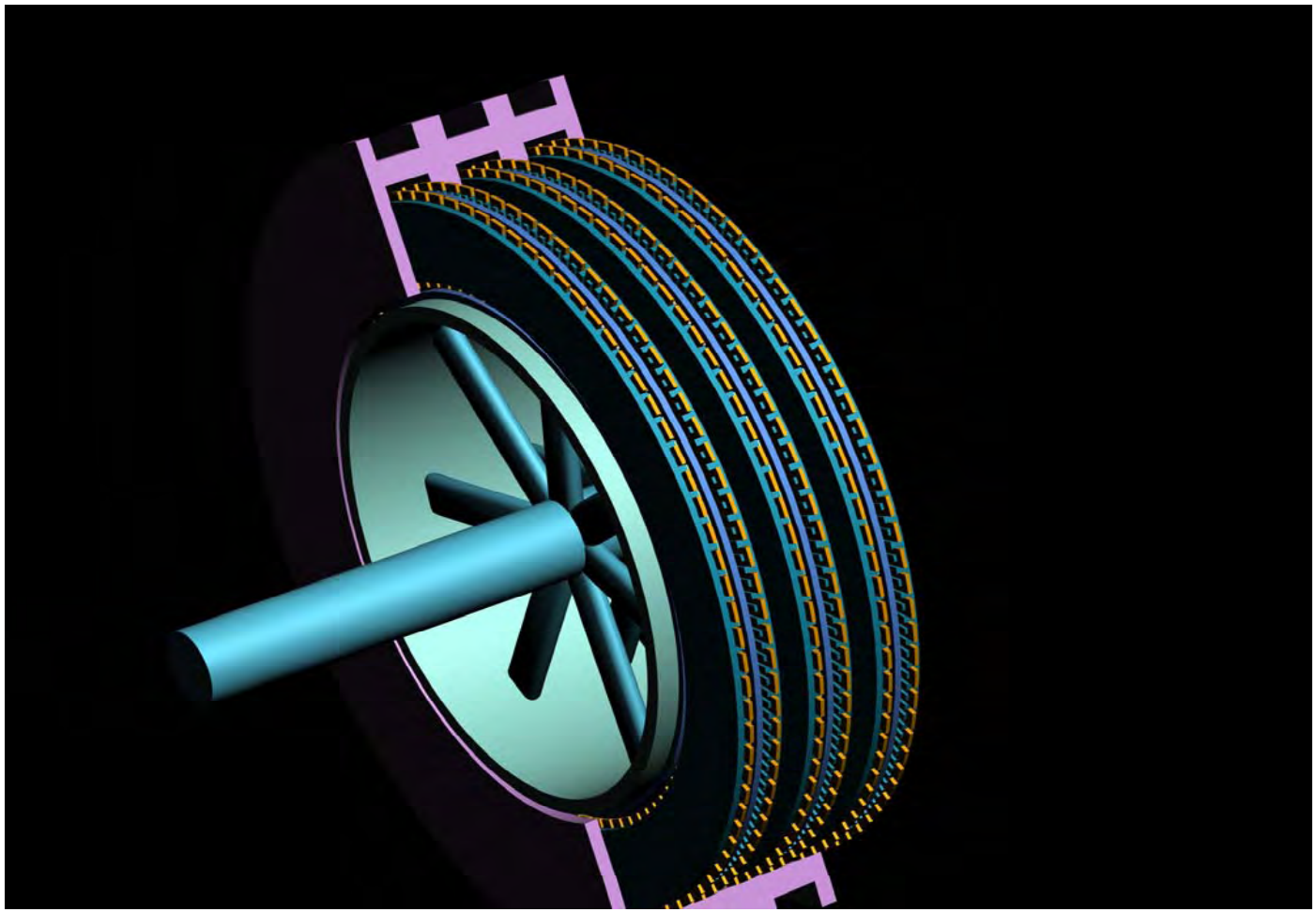


Fra NTNUs verksted

Is it possile to use multidisc axially magnetized generators?



Multidisk stator androtor
- very energy efficient generator



Expectations

- less than one third of the volume

- Integration opportunities

- Large cost reduction on overall system.

-Well suited for up scaling

Challenges to be foced on

- Design concepts for the OFF12MW solution?
  - shaft, bearing, hub, --- what is the cost driver??
- Systems without mechanical bearings?
  - passiv magnetic bearing may reduce the cost dramatically!
- Electromagnetic design
  – integrated low weight generator systems
- Mechanical design
  – flexible designs, like the straw in wind