



European
Commission



Mission:

Develop a novel electric drive system for EVs, free of rare-earth magnets, which meets EV performance requirements (efficiency, power density) and that is feasible for mass-production

Focus:

- Design and manufacture an axial-flux variable-reluctance machine, SRM or PMSynRM
- Demonstrate and validate the capabilities of the developed electric drive system by integrating it into a vehicle

Website: <http://www.venusmotorproject.eu>

Coordinator: Jon Madariaga
Total costs: 2,939,899 €
EC contribution: 1,999,491 €
Start date: 1st November 2013
Duration: 36 months

Research Topics and results:

WP3: Design of the electric drive

- Selected SRM over SynRM solution
- Developed analytical tool for designing SRMs
- Developed 2D and 3D FEM models of SRM
- Developed dynamical model of SRM
- Initial mechanical and electrical design done

Ongoing tasks/objectives:

- Refine electrical design (multivariate analysis)
- Partial test-bench for electrical performance
- Refine mechanical design
- Power electronics & control development

Upcoming milestones/deliverables:

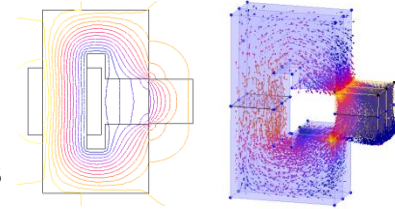
- Final motor design

WP6: Industrialization

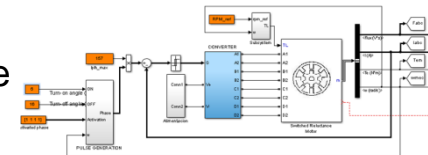
- Initial manufacturability and cost analysis:

MOTOR	
	Cost [€]
Stator active material	333.74
Rotor	118.75
End shield (drive end) + bearing	150.03
End shield (non-drive end) + bearing	129.70
Covers	41.50
Screws	226.50
Total production costs	1002.22
20% safety margin (considering incorrect mechanical design or cost estimate)	200.44
Subtotal	1202.66
30% surcharge for full costs (administration, purchasing, sales and marketing, development and production planning)	360.80
Motor price	1563.46

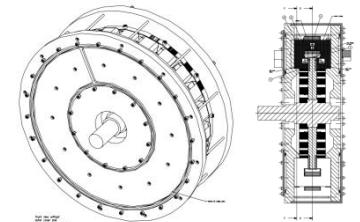
2D & 3D FEM models



Dynamic Model



SR Motor: initial mechanical design



Prep-work for Integration in Vehicle

