

# CAMREG

Centre for Advanced Materials for Renewable Energy Generation

Web: <http://www.camreg.chem.ed.ac.uk>

Email: [camreg@ed.ac.uk](mailto:camreg@ed.ac.uk)

**EPSRC**

Engineering and Physical Sciences  
Research Council



## CAMREG Aims and Objectives:

- Combine activity, know-how and facilities from across a wide range of existing materials science capacity to address the known and emerging challenges in renewable energy generation and storage.
- Include on- and off-shore wind, wave, tidal, conventional and next-generation PV and thermal storage.
- Deliver research to explore, discover and exploit potentially disruptive technologies, through a combination of pre-defined keystone projects and flexibly-funded networked projects.
- Achieve wide-ranging impact continuing research and generate funding.



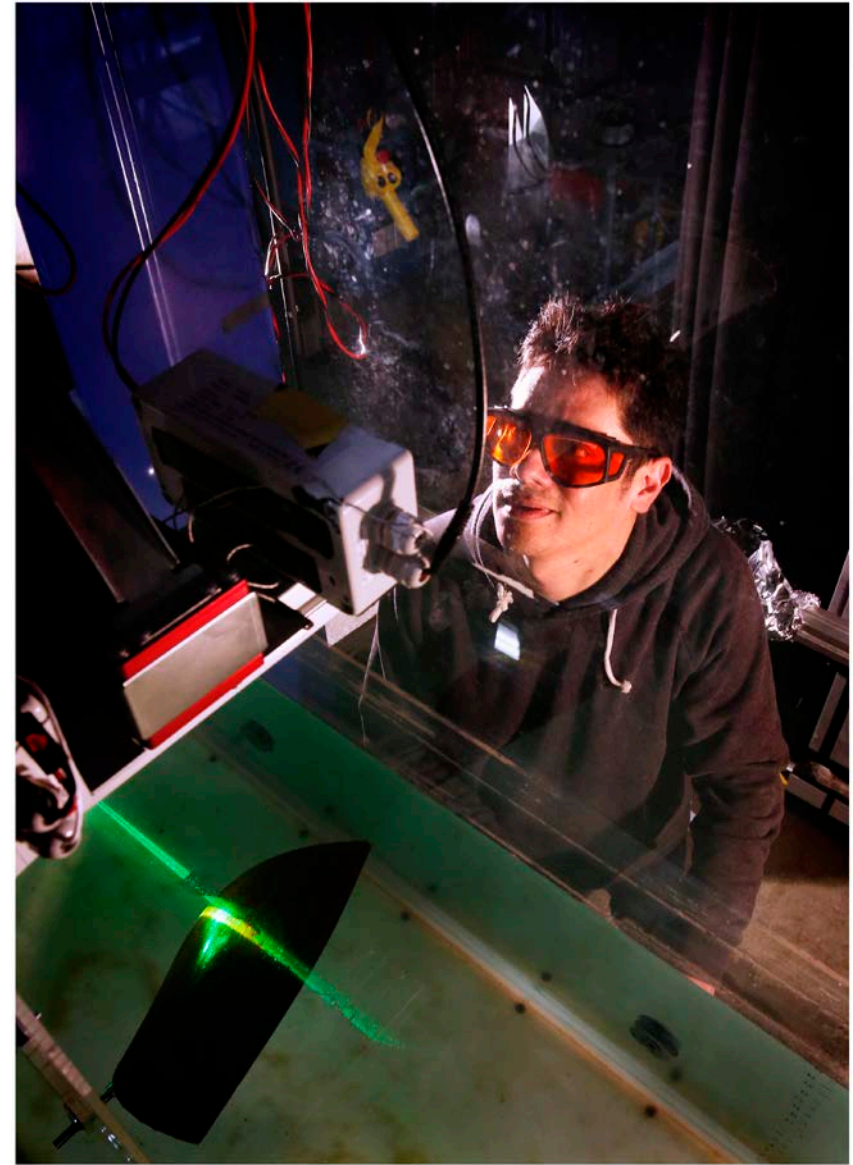


## CAMREG Challenge Arena and Approach

- To reduce the levelled costs of renewable and lower-carbon energy to become competitive in the commercial market.
- To increase technology durability, reliability, utility, performance and energy yield of renewable energy technologies.

## CAMREG areas of research

- Semiconductor materials science.
- materials for PV and energy storage.
- performance of materials in extreme conditions.
- lifetime durability modelling of polymeric composites.
- carbon nanotube growth and deposition.
- coatings to minimise erosion and corrosion.
- improved design of structural steels.
- lifetime testing of materials and structural performance.
- fatigue and fracture mechanics damage modelling.
- large-scale component testing.
- materials fatigue and failure management .
- tribology and tribo-corrosion.
- superconducting materials for power applications.
- high temperature ceramics for energy storage.
- electrically responsive synthetic materials.
- high and ambient temperature molten salt storage.



Att: An America's Cup yacht sail tested in the University of Edinburgh's water flume; the researcher in the photo is Abel Arredondo-Galeana (courtesy of Dr Viola's Applied Fluid Dynamics Research Lab).

## CAMREG Keystone Projects

- The keystone projects (KP) address some obvious and pressing scientific and sectoral challenges.
- Delivered from working collaborations within the partnership.
- Resourced by 6 months of effort from an RA at each of two collaborating departments or partner institutions, or flexibly funded into external partnership.



## CAMREG Keystone Projects

### *Theme 1: Multifunctional materials for energy applications*

KP1 - Optical measurement of strain.

KP2 – In-situ structural monitoring of composites for wind/tidal generation and storage.

KP3 – Fatigue resisting composite materials.

KP4 – Anti-biofouling and self-monitoring coatings.



## CAMREG Keystone Projects

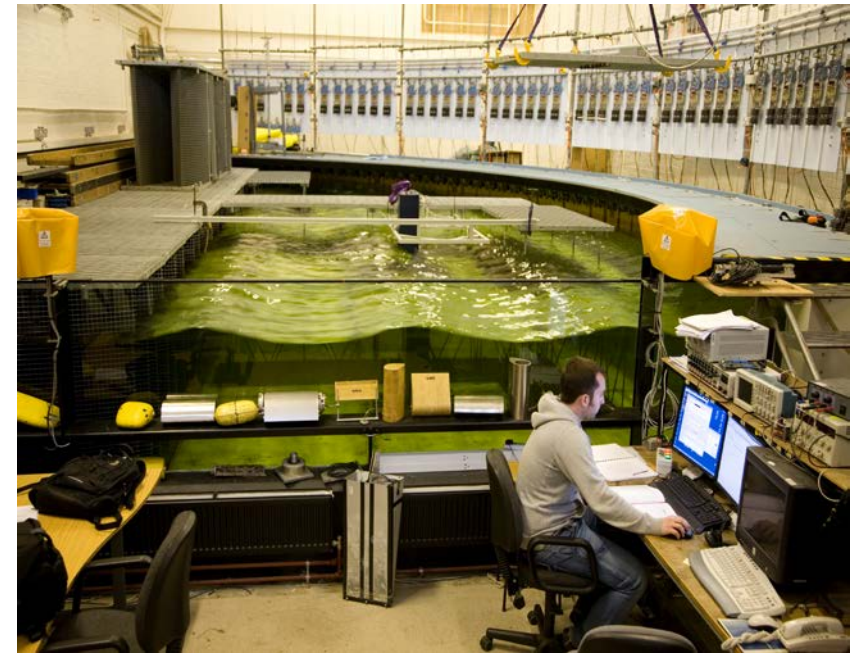
### *Theme 2: Materials for energy conversion and storage.*

KP5 – Manipulating light for enhanced PV generation.

KP6 – Increased power density in electrical generators using carbon nanotube technology.

KP7 - Materials for ultra-high temperature in energy storage energy and recovery.

KP8 – Transformative thermal energy storage using molten salts.



## CAMREG Keystone Projects

### *Theme 3: Smart materials for energy applications.*

KP9 – Morphing aero- and hydro-dynamic working surfaces.

KP10 - Dielectric elastomers for power take-off.

KP11 – Programmable flexible materials for mooring and station keeping.

KP12 – Damage tolerant and self-repairing structures.







# CAMREG

Centre for Advanced Materials for Renewable Energy Generation

Web: <http://www.camreg.chem.ed.ac.uk>

Email: [camreg@ed.ac.uk](mailto:camreg@ed.ac.uk)

