

European Metrology Research Programme



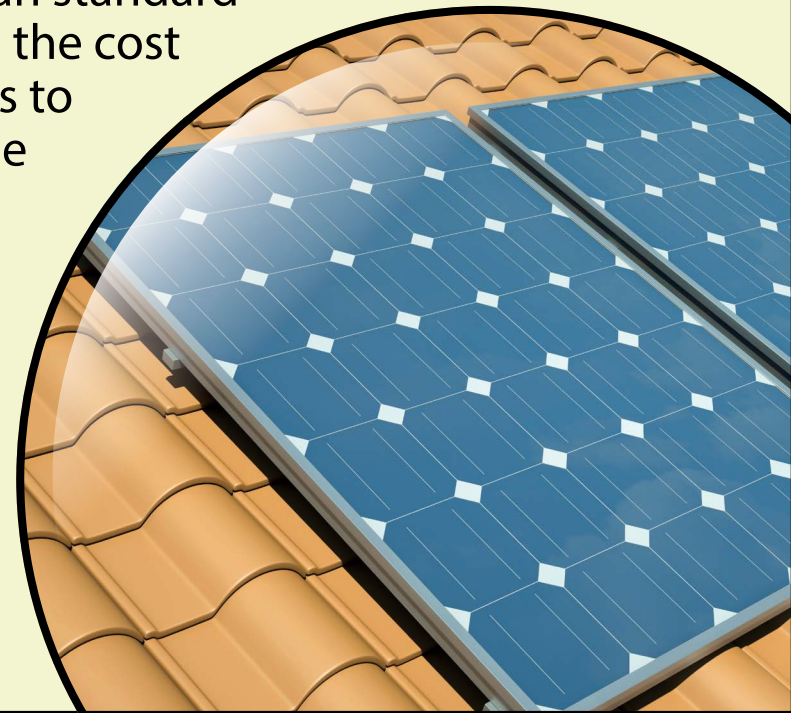
Energy II

An overview of the funded projects from the Targeted Energy Programme

Supporting solar cells

Developing tools for next generation of solar cells (ENG51)

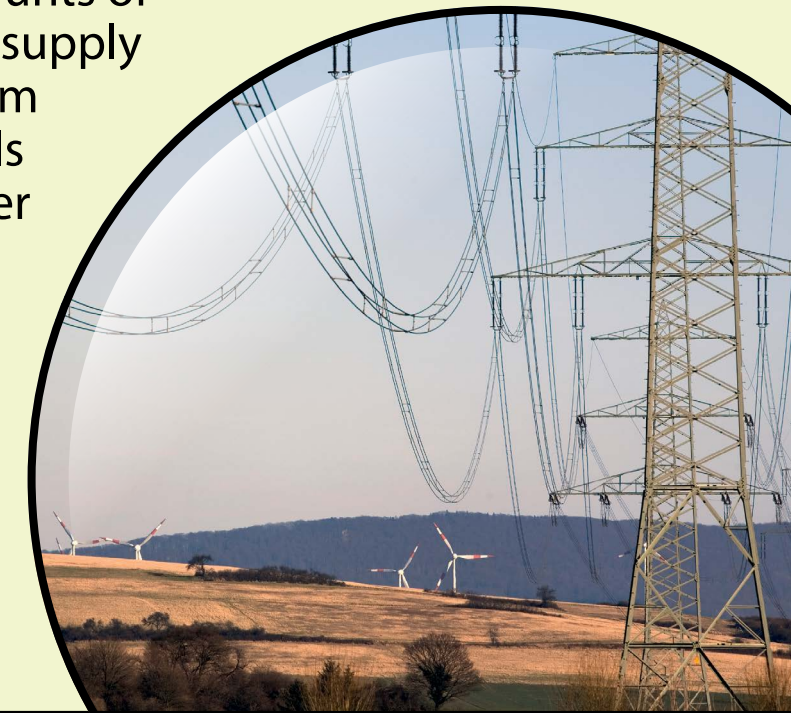
Concentrated photovoltaics (CPVs) use cheaper optical elements and offer more efficient solar energy conversion than standard photovoltaics. This project aims to reduce the cost of CPVs by developing measurement tools to improve current efficiencies and create the next generation of solar cells.



Stabilising electricity grids

Providing measurement tools for Smart Grids (ENG52)

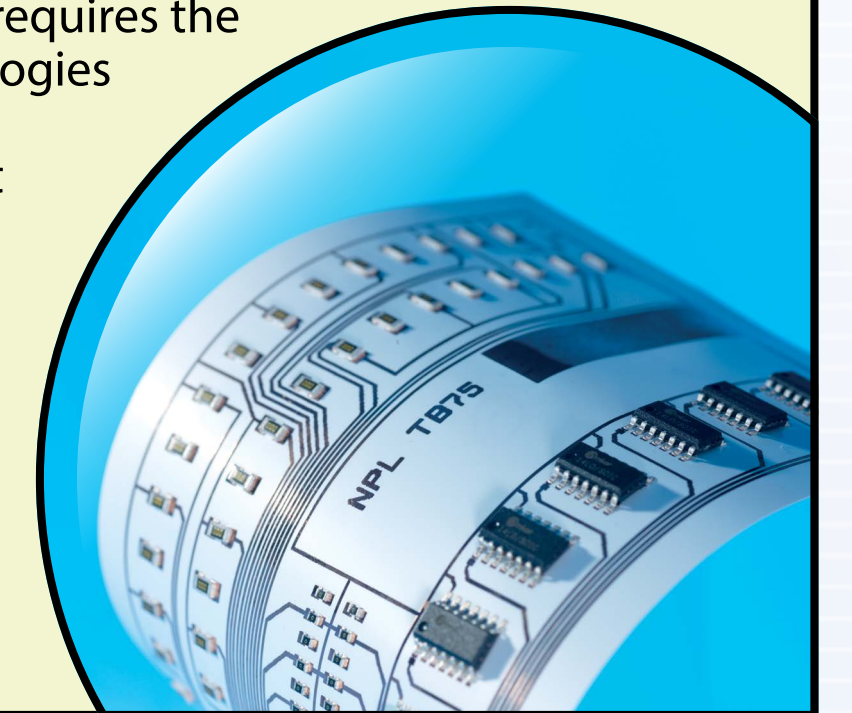
The power provided by renewable energy can be intermittent. Smart Grids are needed to reliably manage large amounts of renewable energy, by balancing variable supply with changing demand. Following on from ENG04, this project will develop new tools to assess the quality and stability of power supplies and enable stable Smart Grid operation and control.



Thin Energy

Thin film measurements to support low carbon technology (ENG53)

Europe's shift to a low-carbon economy requires the development of a wide-range of technologies such as solar energy. Complex thin films form the basis of these technologies, but there are technical challenges related to performance, durability and cost requirements. This project takes an innovative approach to developing measurement frameworks for these thin film challenges.



Diversifying the natural gas supply

Promoting the use of biogas (ENG54)

There is an urgent need to increase the amount of biogas in natural gas networks with European Commission targets specifying that 20 % of energy should come from renewables and 10 % of transport fuel from biofuels. This project will enable the gas industry to reliably measure key properties of biogas and biomethane to help meet these targets.



Energy output of solar cells

Eliminating uncertainty in photovoltaics (ENG55)

There is a growing European market for photovoltaic (PV) solar power. Current European standard test conditions represent climate conditions in the USA which can lead to inaccurate estimates of real energy yields. This project will develop a new classification system of PV devices based on energy production under differing operational conditions.



Reliable wind energy

Improving the reputation of wind energy (ENG56)

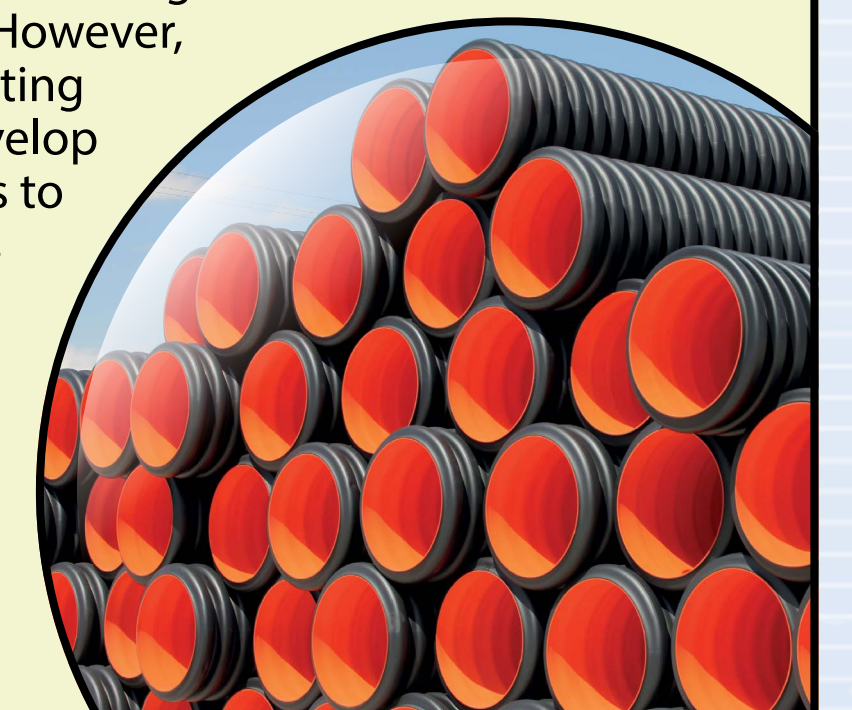
Wind energy systems, while regarded as highly promising technologies, still require improved reliability. 30 % of failures are caused by mechanical problems which can lead to costly downtimes of several weeks. This project will develop calibrated measuring standards to prevent unnecessary costs by reducing mechanical failures and extending the lifetime of wind generators.



Better materials for energy

Improving detection of defects in new materials (ENG57)

Fibre reinforced plastics are ideal for renewable energy applications because of their excellent mechanical properties, low weight and resistance to corrosion and fatigue. However, a lack of accurate defect detection is limiting current exploitation. This project will develop traceable procedures for new techniques to accurately detect a range of defect types in these new materials.



Energy security

Measuring combined oil, water and gas flows (ENG58)

New smaller, deeper and more remote oil and gas wells are being increasingly exploited as larger reserves dwindle. The uncertainty levels in the measurement of multiphase flows in these newer wells are currently high (up to 20 %). This project will improve upon these uncertainties and help establish the infrastructure to develop a sustainable measurement reference network.



Non-Newtonian fluids

Looking at the uncertainty of viscosity measurement tools (ENG59)

Non-Newtonian fluids, such as drilling fluids, have a viscosity that changes under stress and there is an unmet need for traceable and accurate measurement of this property. This project will map existing measurement uncertainties and review the physics impacting non-Newtonian viscosities to improve operational efficiency in the energy sector and help enable the construction of complex wells.



Fair trade and transport for Liquefied natural gas

Improving energy measurements of LNG and its use as a transport fuel (ENG60)

The use of Liquefied Natural Gas (LNG) as a transport fuel could offer a cleaner way to power cars and ships. Measurements of the energy contained within LNG have higher uncertainties than those of other fuels. Following on from ENG03, this project will reduce these uncertainties by half, which will lead to fewer balancing errors and economic and environmental benefits.



New electrical measurements for the grid

New sensor technologies to support energy trading and security of supply (ENG61)

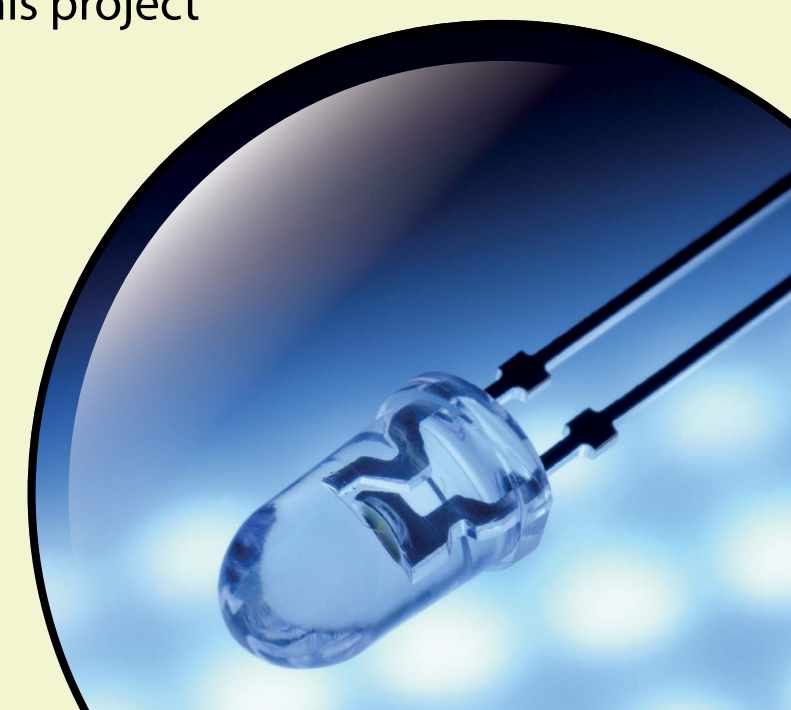
National grid companies need to develop their infrastructure as new renewable energy sources become integrated into the grid. This project will support the introduction of new technologies for electrical sensing and the upgrade of conventional transformers to help address current limitations of renewable energy sources. New technologies will enable lightweight and accurate measurement systems for voltage and current and better control of the network.



Innovative Lighting

New measurements for solid state lighting (ENG62)

The performance of new solid state lighting (SSL) products needs improved confidence. Following on from ENG05, this project will develop new measurements, reduce uncertainties in existing measurements and create novel metrics to improve the quality of these products. Physiological studies will investigate safety, comfort and user perception, enabling reliable performance testing, covering light output, efficiency, distribution and quality, as well as safety and lifetime.



Sensor network metrology

Improving the monitoring of electrical distribution grids (ENG63)

As reliance on distributed renewable energy increases, it is vital that electrical grids can be managed and controlled to enable grid stability and reduce the possibility of blackouts. This project will develop techniques to enhance the capabilities of sensor networks, which will improve the monitoring and knowledge of electrical distribution grids and enable more secure and reliable grids with reduced carbon emissions.



Europe's National Measurement Institutes working together

The European Association of National Metrology Institutes (EURAMET) has implemented the European Metrology Research Programme (EMRP), a programme with a value of over 400 M€, organised by 23 NMIs and supported by the European Union.

Full details can be found at: www.euramet.org

Dr Duncan Jarvis - EMRP Programme Manager

E-mail: emrp-pm@euramet.org

Phone: +44 20 8943 6707

EURAMET e.V.
Bundesallee 100
38116 Braunschweig
Germany

EMRP
European Metrology Research Programme
Programme of EURAMET



The EMRP is jointly funded by the EMRP participating countries within EURAMET and the European Union