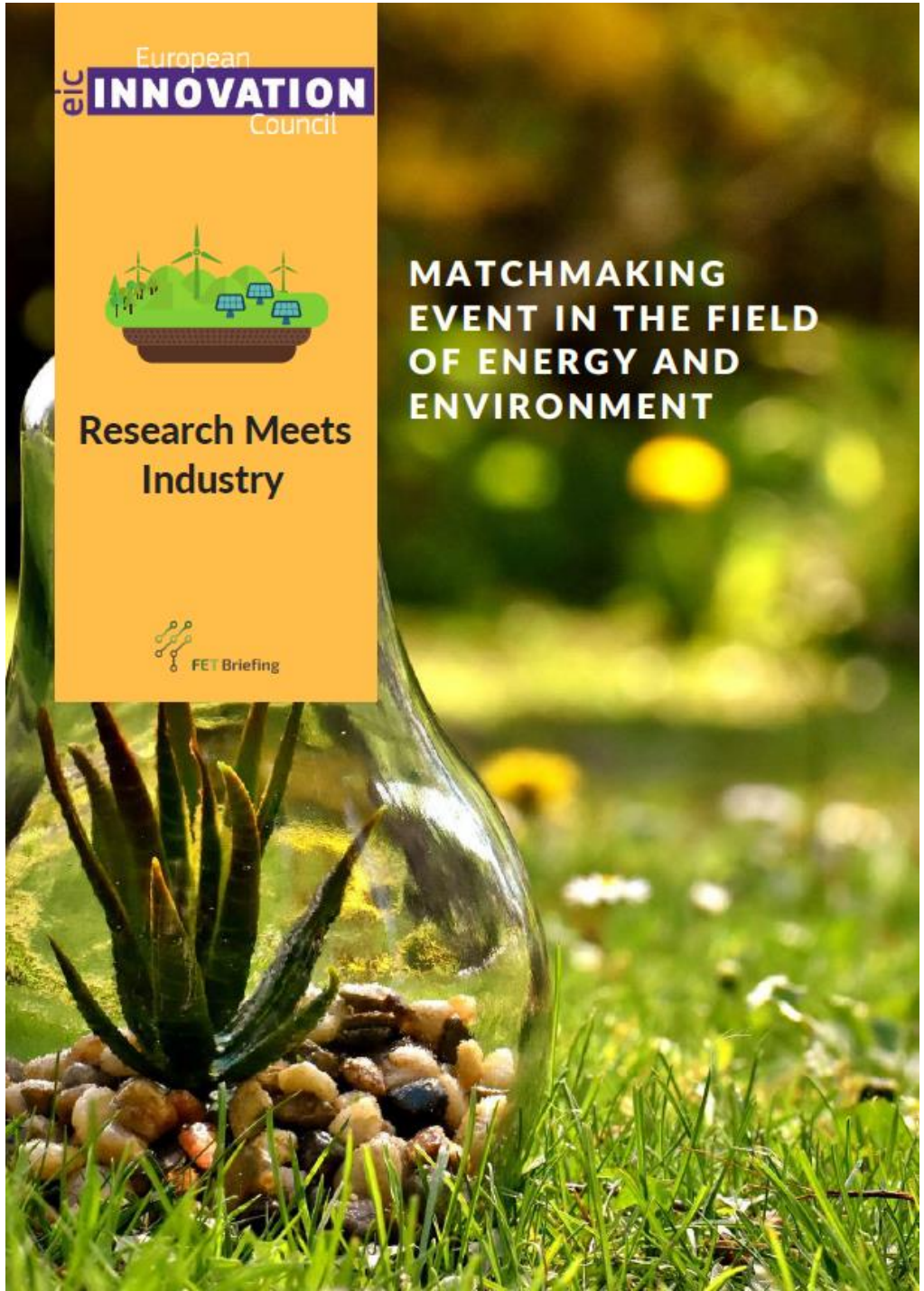

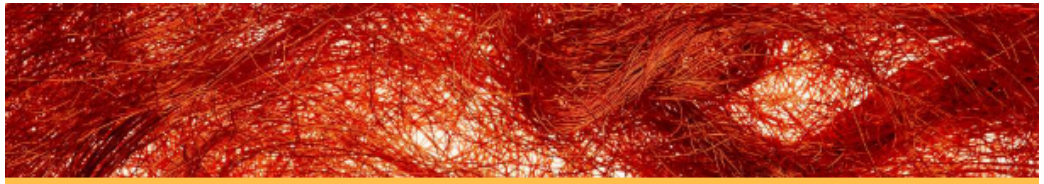

MATERIALS AND TECHNOLOGIES FOR ENERGY AND ENVIRONMENT

A fundamental breakthrough in detecting atmospheric radicals
Justin Holmes and Tamela Maciel, University College Cork (RADICAL)

RADICAL aims to develop a brand-new way of detecting atmospheric radicals in real-time. This will be a small, low-cost electronic sensor that will 'sniff' out short-lived radicals such as hydroxyl and nitrate, which play a key intermediary role in day- and night-time air quality.
This has never been done before, but if it works, our new RADICAL sensors will be cheap, small and able to be rolled out on a global scale to help us better monitor and model the role of radicals in air pollution and climate change.
These low-cost electronic sensors could also be adapted to detect other gases with a wide range of potential applications.

Plasma-based machine for a large-scale production of graphene&derivatives
Elena Tatarova, Institute for Plasmas and Nuclear Fusion of IST (PEGASUS)

The project PEGASUS embodies plasmas driven controllable design of matter at atomic scale level. PEGASUS ultimate goal is to create a highly efficient, catalyst/harmful-free novel and disruptive plasma method along with a proof-of-concept PEGASUS machine for a large-scale graphene/N-graphene direct synthesis, as well as N-graphene/metal oxides nocomposites and unique vertical N-graphene arrays grown on metal substrates, via breakthrough research on plasma-enabled singular assembly pathways.

We've developed a disruptive technology and a proof-of-concept machine for the manufacturing of high-quality graphene&derivatives at a large-scale. By applying special protocols, different advanced high-quality nanostructures with controllable properties, can be fabricated. The process is controllable, environmentally friendly, generates hydrogen as a by-product, is automated and produces batches of graphene or derivatives with consistent characteristics that can be directly used in applications.