

Welcome

to the first issue of the Power2Hype Newsletter!

Power2Hype, a project funded by Horizon Europe, aims to establish a **sustainable route for hydrogen peroxide (H₂O₂)** production based on **air and water** as only feedstock and **renewable energy** as the sole energy source.

Curious how?

Hydrogen peroxide will be synthesised by paired electrolysis at both the cathode and anode using an innovative custom-made 200% electrolyser. Aiming for the electrification and decentralisation of the chemical industry, Power2Hype proposes the TRL 5-6 demonstration of electrolytic hydrogen peroxide production at any given concentration (from 3 to 99 %) at the site where it is needed, e.g., for sanitation purposes, bleaching applications or even as propulsion fuel.

The project will unfold in three phases:

- Phase #1**
Addresses the fundamental aspects of electrochemical H₂O₂ production.
- Phase #2**
Focuses on cell design, scale up and integration of a downstream process.
- Phase #3**
Showcases the integrated electrochemical process at TRL 5-6, producing commercially relevant concentrations of H₂O₂. A digital twin demonstrator will enable modelling and predictive process integration. This tool will also be able to adapt to fluctuating renewable power supply dynamics.

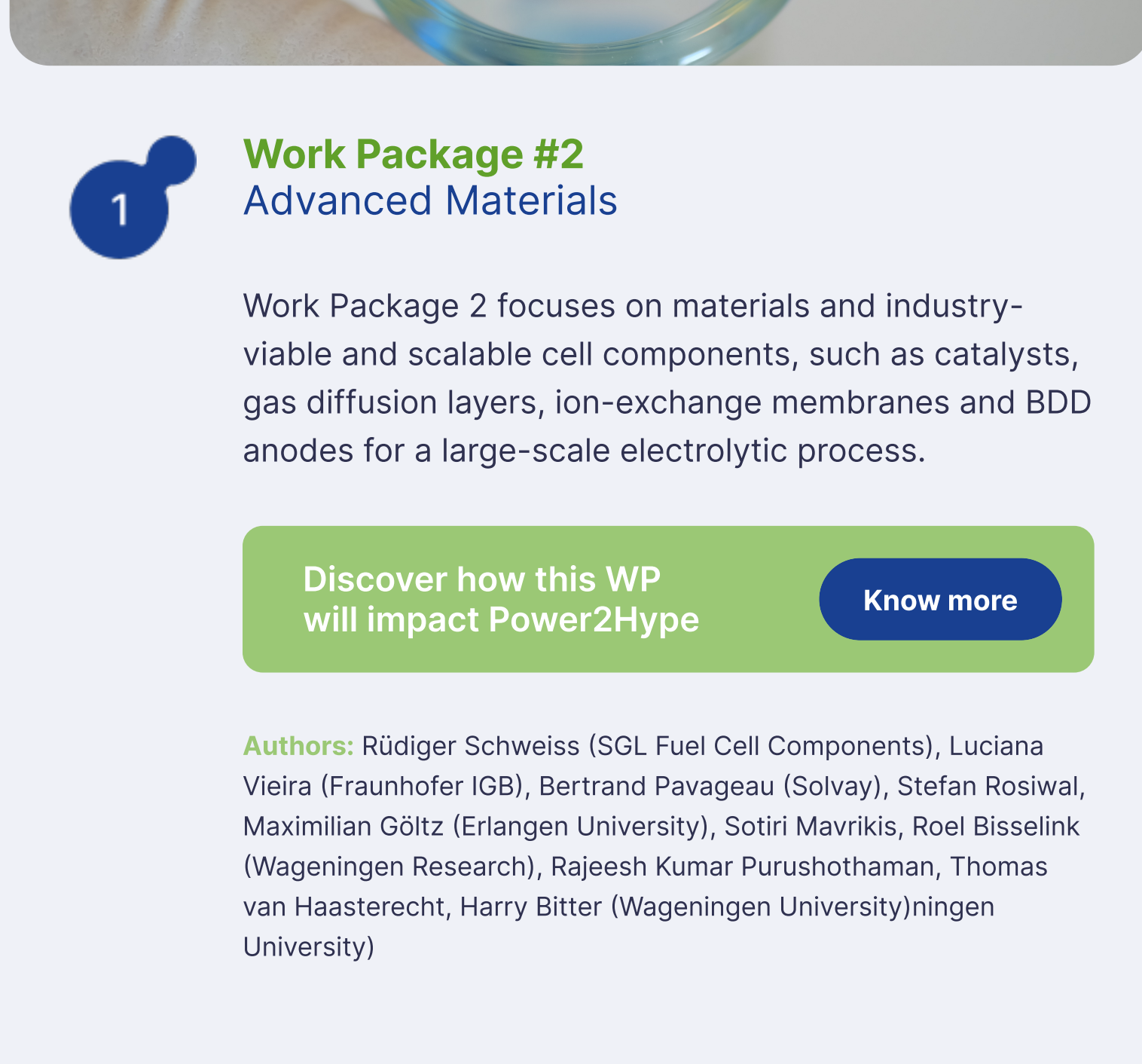
The economic, environmental, and societal impacts of Power2Hype technology will be thoroughly evaluated using experimental data and system modelling.

At the project's core is a consortium that includes 11 expert partners from diverse fields encompassing the entire H₂O₂ value chain. It brings together leading industrial firms, top universities, research institutes, technology developers, and a communication agency.

[Read more about the project](#)

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Our news



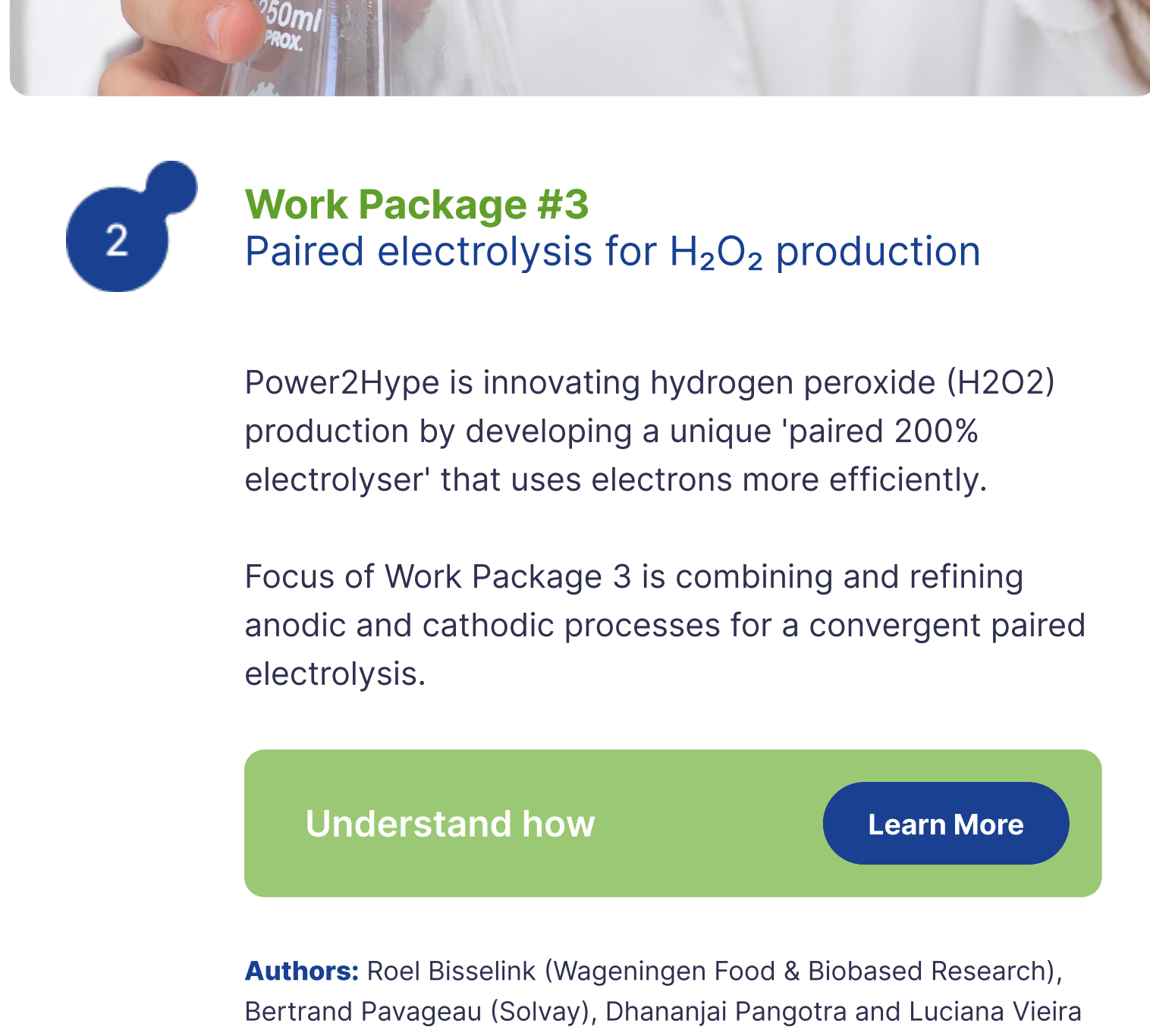
- Work Package #2**
Advanced Materials

Work Package 2 focuses on materials and industry-viable and scalable cell components, such as catalysts, gas diffusion layers, ion-exchange membranes and BDD anodes for a large-scale electrolytic process.

[Discover how this WP will impact Power2Hype](#)

[Know more](#)

Authors: Rüdiger Schweiss (SGL Fuel Cell Components), Luciana Vieira (Fraunhofer IGB), Bertrand Pavageau (Solvay), Stefan Rosiwal, Maximilian Göltz (Erlangen University), Sotiri Mavrikis, Roel Bisselink (Wageningen Research), Rajeesh Kumar Purushothaman, Thomas van Haastrecht, Harry Bitter (Wageningen University)ninggen University)



- Work Package #3**
Paired electrolysis for H₂O₂ production

Power2Hype is innovating hydrogen peroxide (H₂O₂) production by developing a unique 'paired 200% electrolyser' that uses electrons more efficiently.

Focus of Work Package 3 is combining and refining anodic and cathodic processes for a convergent paired electrolysis.

[Understand how](#)

[Learn More](#)

Authors: Roel Bisselink (Wageningen Food & Biobased Research), Bertrand Pavageau (Solvay), Dhananjai Pangotra and Luciana Vieira (Fraunhofer IGB)



- Work Package #4**
Cell design and process integration

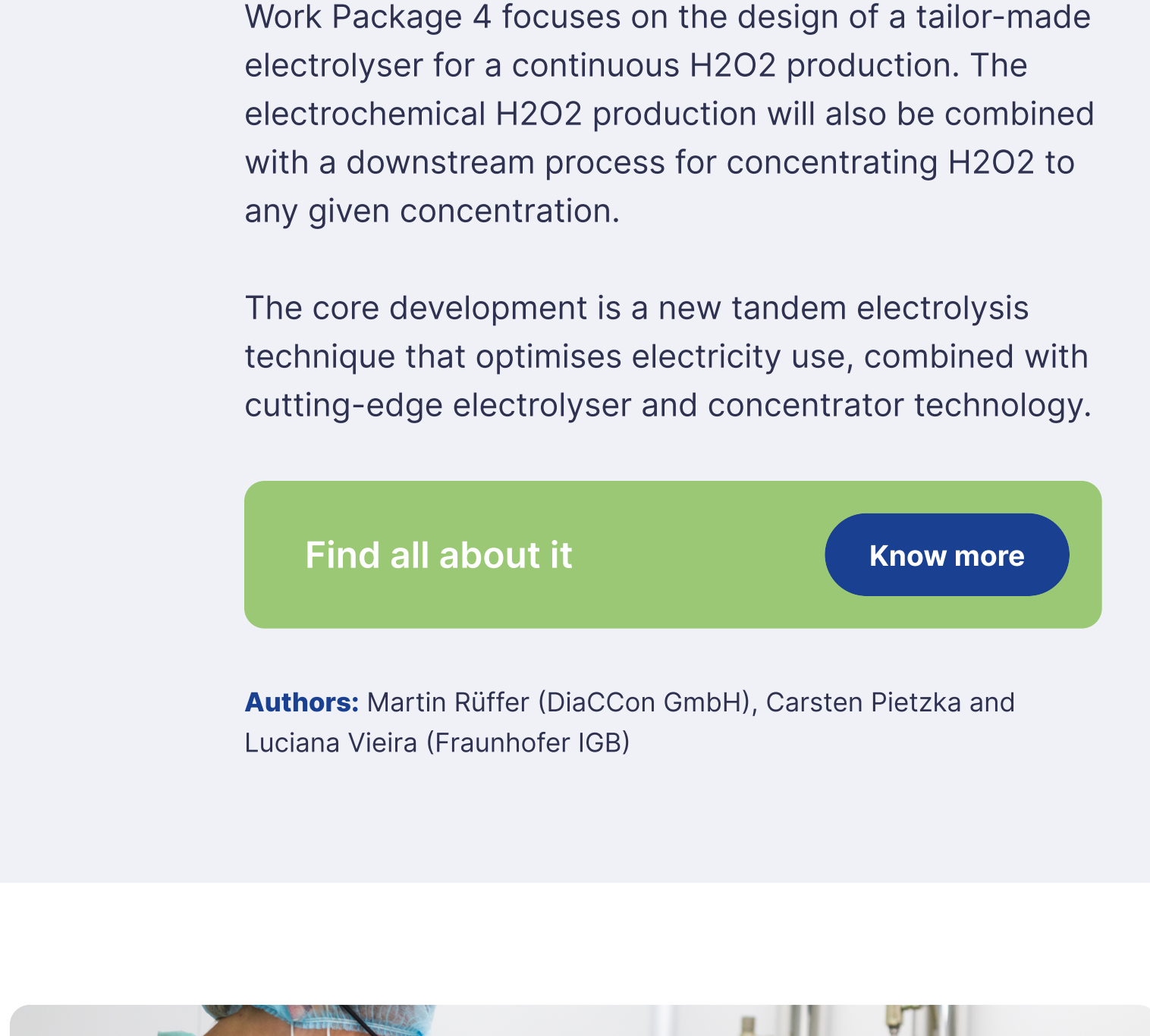
Work Package 4 focuses on the design of a tailor-made electrolyser for a continuous H₂O₂ production. The electrochemical H₂O₂ production will also be combined with a downstream process for concentrating H₂O₂ to any given concentration.

The core development is a new tandem electrolysis technique that optimises electricity use, combined with cutting-edge electrolyser and concentrator technology.

[Find all about it](#)

[Know more](#)

Authors: Martin Ruffer (DiaCCon GmbH), Carsten Pietzka and Luciana Vieira (Fraunhofer IGB)



- Work Package #5**
Pilot plant design, build and commission

With the development for the next generation of H₂O₂-production in mind, Work Package 5 goal is to design, construct, and trial a pilot plant capable of producing several kg/day of H₂O₂ from just air, water, and electricity.

[You can learn more](#)

[Know more](#)

Authors: Enrique Garcia (Técnicas Reunidas), Luciana Vieira (Fraunhofer IGB)



- Work Package #6**
Demonstration

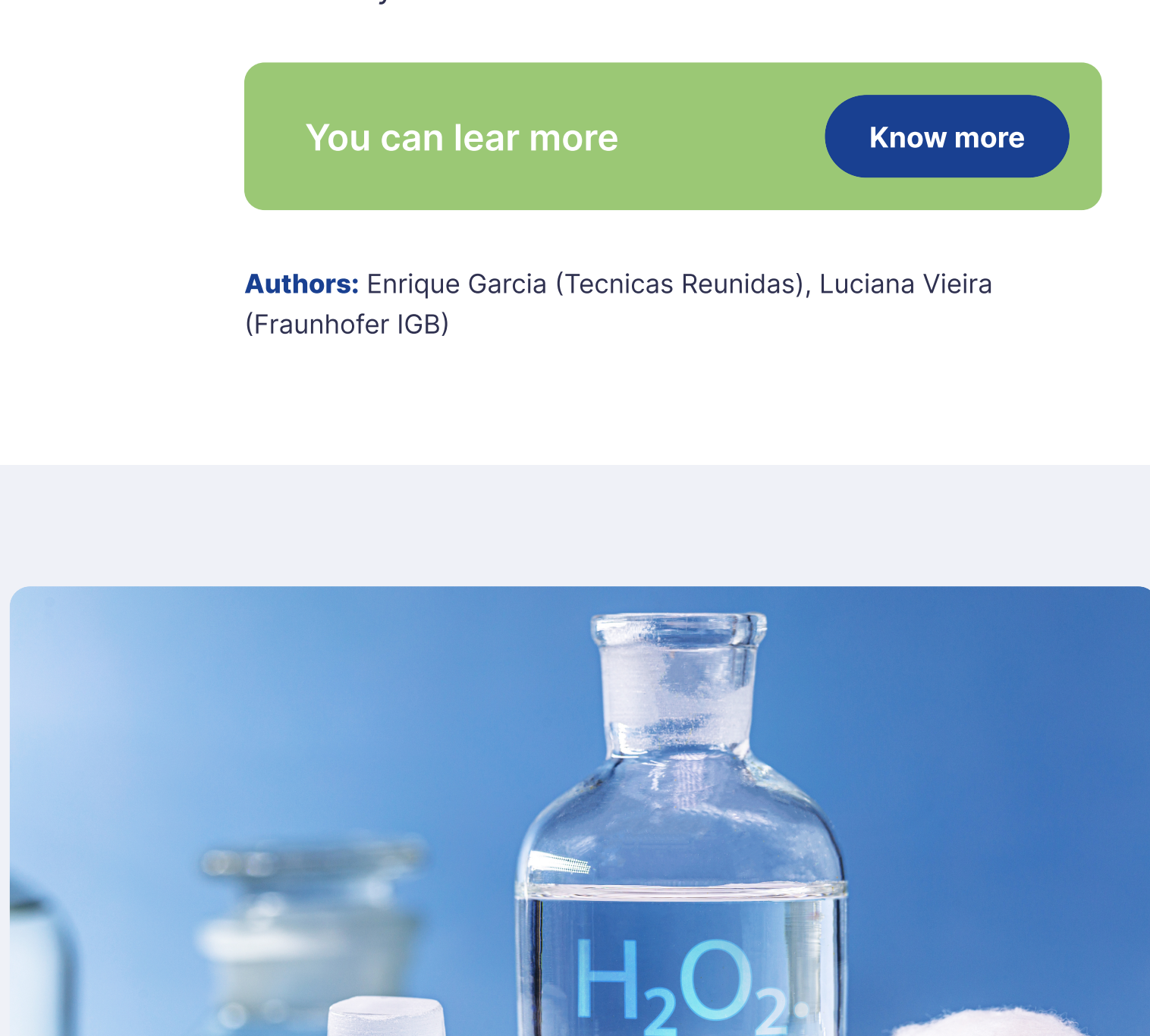
In Work Package 6 the electrosynthesis of H₂O₂ will be demonstrated in a pilot scale.

Priority is to conduct a mid-scale pilot study to evaluate the practicality, time, costs, and scalability for implementing a large scale commercial process for producing electrolytic H₂O₂.

[Interesting right? Read all about it!](#)

[Know more](#)

Authors: Javier Diaz-Maroto Carpintero (Solvay), Enrique Garcia Diez (Técnicas Reunidas), Pranav Prasad (SolvGE), Alexandra Poch (IRIS), Luciana Vieira and Arne Roth (Fraunhofer IGB)



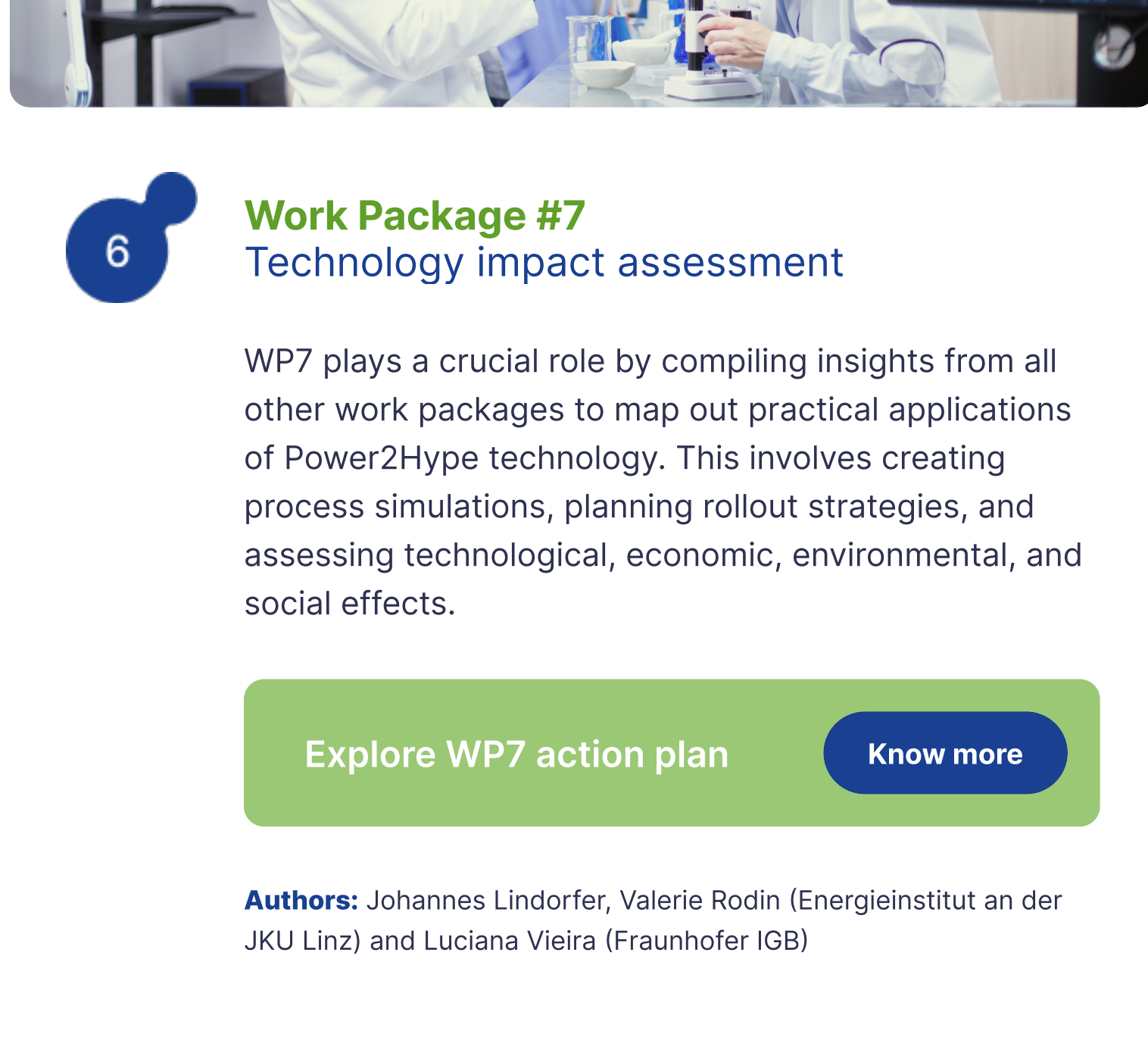
- Work Package #7**
Technology impact assessment

WP7 plays a crucial role by compiling insights from all other work packages to map out practical applications of Power2Hype technology. This involves creating process simulations, planning rollout strategies, and assessing technological, economic, environmental, and social effects.

[Explore WP7 action plan](#)

[Know more](#)

Authors: Johannes Lindorfer, Valerie Rodin (Energieinstitut an der JKU Linz) and Luciana Vieira (Fraunhofer IGB)



Last but not least

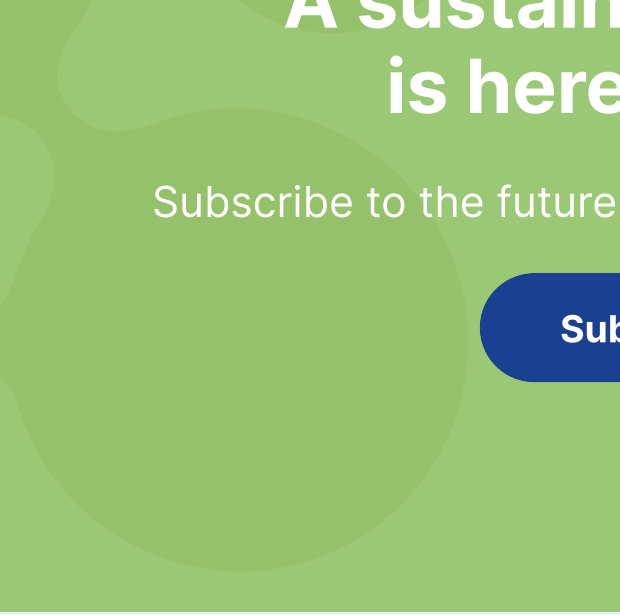
That's a wrap on this first edition of the Power2Hype newsletter! But there's more:



Presentation

Don't forget to browse our project presentation.

[Here](#)



Video

Watch our video.

[Here](#)



Brochure

Flip through our informative brochure.

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