

Fingerprint 2 Footprint

Publieke samenvatting / Public summary

Aanleiding

Dutch industry is under constant pressure to reduce their energy footprint, to become circular and to reduce emissions. There is plenty of space to improve: the footprint of raw materials and energy-intensive processes is revealed more and more and every data point matters to globally improve industrial sustainability, resilience, and raw material consumption. Fingerprints are thereby very well-suited to take faster, more adequate and better-timed actions that will considerably decrease the process footprint. Currently fingerprints are mainly collected to determine Quality in materials streams. Industry 4.0 will however enable a translation to other KPIs (Safety, Delivery, Cost, Maintenance, Environment). This requires a new value chain of information that integrates new AI, engagement of operator personnel and insight into the links between process fingerprints and environmental and economic footprints. The actual cost of deploying in situ fingerprinting technology versus the real value to process performance and footprint reduction is then the main driver for Fingerprint 2 Footprint.

Doelstelling

Fingerprint 2 Footprint translates chemical fingerprint measurements inside and near chemical processes into information useful to reduce environmental footprints, while retaining or improving process economy and consistency.

Korte omschrijving

Fingerprint 2 Footprint will follow a two-sided approach: the Knowledge Institutes will develop

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Algemene informatie / General information

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generic digital and analytical strategies to pursue objectives 1-4. They will validate, illustrate and demonstrate these on specific case studies proposed by the industrial consortium participants. Fingerprint 2 Footprint pursues four objectives to reach this aim: 1) Assessment of the optimal fingerprint technology for a given measurement context. 2) Developing optimally simplified in situ measurement protocols for operator personnel. 3) Integrating the fingerprint data into existing process data infrastructures for process value. 4) Understanding how and where faster and more accurate fingerprint-based actions may benefit process consistency, economy and sustainability in co-creation with process operators. These four objectives are validated, demonstrated and illustrated by several complementary case studies relevant to Wastewater quality, Industrial Electrification, Process Intensification and Circular economy.

Resultaat

F2F delivers the digital infrastructure to enable a new value chain of process information, from chemical fingerprint to performance footprint. This infrastructure involves: 1) A quantitative method for fingerprint Process Analytical technology assessment from a Value Proposition framework. 2) A systematic method for measurement design with in situ fingerprint technologies (on/in-line or handheld), tailor-made for operator practice. 3) A quantitative approach to integrate fingerprint data into existing process data and Quality Control infrastructure to create complementary value for action. 4) Quantitative prediction/assessment on how fingerprint PAT supports improvement of corporate KPIs, providing new insight for technology-to-sustainability without loss of economic performance. 5) These technological deliverables will be integrated and demonstrated in engaging industrial case studies in different process domains (such as circularity, chemical and water) and in different stages of production (raw material characterization, process operations and emissions analysis).

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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