European Training Network for the Sustainable, zero-waste valorisation of critical-metal-containing industrial process residues (SOCRATES)

D6.14 Updated Exploitation Plan

Confidential

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Date:

[29-10-2018]

This project has received funding from the European Union's EU Framework Programme for Research and Innovation Horizon 2020 under Grant Agreement No 721385

1. GENERAL EXPLOITATION PHILOSOPHY FOR SOCRATES

The SOCRATES exploitation strategy (**Figure 1**) contains four exploitation routes, each of which is contiuously assessed per ESR project. The ESRs are actively involved in pursuing exploitation routes and develop and continuously update an exploitation section in their Training Progress reports (i.e. RTDE in **Figure 1**: "Research, Training, Dissemination, Communication and Exploitation report"). Apart from working with their main supervisors, the ESRs are guided by their non-university supervisors to investigate the best possible exploitation route. The ERSs are also continuously trained through the SOCRATES entrepreneurial soft-skills training. An experienced Exploitation Manager (P.T. Jones, KU Leuven) has been appointed to guide the ESRs, with the aim to commercially exploit all breakthrough results, irrespective of the training and dissemination goals.

The four exploitation routes are:

- (EX1) Dedicated (bilateral, national and EU) follow-up projects targeting higher Technology Readiness Levels (TRL), including H2020 and (future) FP9 (Research and) Innovation Action Projects (e.g. SC5 Programme) and EIT RawMaterials KIC Added Value projects;
- (EX2) Industrial implementation;
- (EX3) Patenting and licensing of breakthrough results;
- (EX4) Spin-off & Spin-out creation.

The Exploitation strategy goes hand in hand with the dissemination (of science/technology) strategy. The dissemination strategy is highlighted in **Table 1**. The research results of SOCRATES are published only after an initial review of its potential for patenting and IPR, which may lead to commercial exploitation. Knowledge and other deliverables with no direct market potential become public domain. A strict publication procedure has been added to the SOCRATES CA:

> 8.3.1.1 During the Project and for a period of 1 year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article 29.1 of the Grant Agreement subject to the following provisions. Prior notice of any planned publication shall be given to the other Parties at least 30 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the Coordinator and to the Party or Parties. proposing the dissemination within 15 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.
>
> 8.3.1.2 An objection is justified if the intended publication
> (a) would prevent patenting or other protection of the objecting Party's Results or Background by registration, or
> (b) includes Background, unpublished Results or Confidential Information of the objecting Party.
> The objection has to include a precise request for necessary modifications.
>
> 8.3.1.3 If an objection has been raised the involved Parties shall discuss how to overcome the justified grounds for the objection on a timely basis (for example by amendment to the planned publication and/or by protecting information before publication) and the objecting Party shall not unreasonably continue the opposition if appropriate measures are taken following the discussion. The objecting Party can request a publication delay of not more than 90 calendar days from the time it raises such an objection. After 90 calendar days the publication is permitted, provided that Confidential Information of the objecting Party has been removed from the Publication as indicated by the objecting Party.

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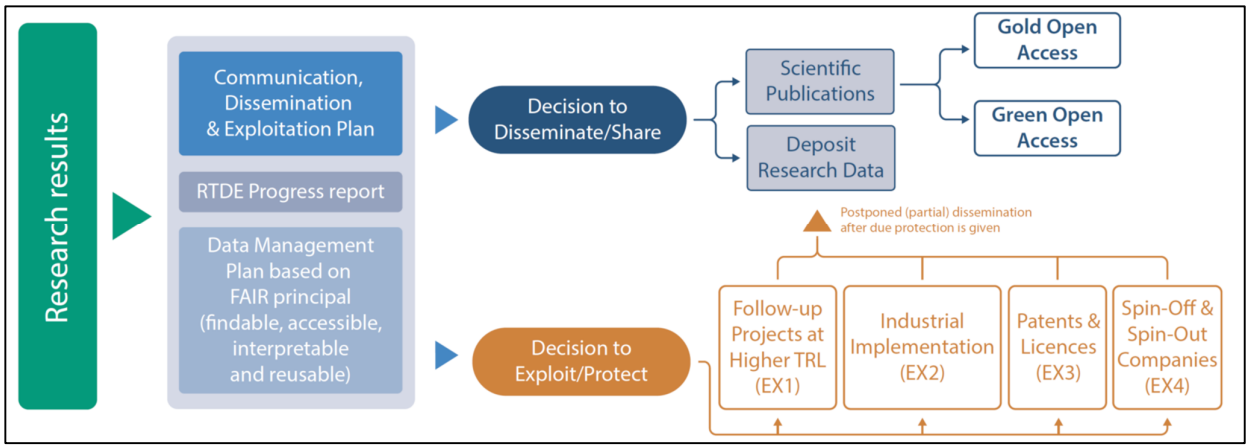

Figure 1. *Exploitation concept for ETN SOCRATES.*

Table 1. *Dissemination strategy for ETN SOCRATES (synchronised with Exploitation Strategy, see also* ***Figure 1****)*

Target groups	Main activities & channels	Method of verifying impact
Dissemination of research results (for maximum take-up of new knowledge and exploitation of results)		
Industry target groups of ETN results (mining and metallurgy sector, construction sector, cleantech etc.)	• Summer School and Symposium • Job Fair and Exhibition showing ESR results	# Industry participants # ESRs recruited by companies # Patents filed and licensed
Academic and Professional networks linked to SOCRATES Network	• SOCRATES Summer School and Symposium • SOCRATES Newsletter (see also Communication section) (e.g. http://etn-socrates.eu/communications/newsletter/ • Peer-reviewed papers (*The International Journal of Life Cycle Assessment, Journal of Sustainable Metallurgy, Green Chemistry, Journal of Cleaner Production, Minerals Engineering, Cement and Concrete Research, Nature Chemistry*etc.) deposited on OpenAire compliant Repositories (present status: http://etn-socrates.eu/communications/science-communication/) • Papers in International Conferences and Symposia (ELFM, SVS, EMC, TMS, ICGC, ISEC etc.) (present status: http://etn-socrates.eu/communications/science-communication/) • Pitch presentations and posters during EIP & EIT brokerage events • Open Access research data	# Industry participants in events # Attendants in events in general # Downloads, citations (papers) # People asking for feedback
National and EU Policy Makers and Public Entities	• Articles in EC's research*eu results magazine/focus & Horizon Magazine • Integration in EC's Newslettters • Videos on EURONEWS • Press releases	# Articles/posts (in EC Magazines/Newsletters) # Views (videos) # Articles in national media

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2. SPECIFIC EXPLOITATION ROUTES FOR SOCRATES

In **Table 2** the possible exploitation routes are qualitatively indicated per ESR (vvv: high potential relevance; vv: medium, v: possible but not too likely). As the project evolves, certain routes will become more clear, while others will become obsolete. The exploitation routes will be further specified (per ESR) as the results become more tangible. For example: follow-up project opportunities will be determined according to the call/project type (e.g. H2020/FP9 RIA, H2020/FP9 IA, EIT KIC RawMaterials Upscaling, bilateral funding), the technology to be exploited and its TRL level target. Table 2 will force the ESRs to scrutinise the potential options and to prioritise them, together with their core and industry supervisors.

Throughout the project the relevant patent landscape (that was reviewed for each ESR topic to ensure freedom-to-operate during the project initiation phase).

Table 2. *Exploitation Routes for the 15 ESRs in SOCRATES (preliminary status). Amount of v's indicate level of potential relevance of this Exploitation Route.*

ESR	Name ESR	Recruiting Benef'	Topic	Main Exploitation Routes (see Figure 1)			
				EX1 Follow-up projects	EX2 Industrial Implementation	EX3 Patents & Licensing	EX4 Spin-off & Spin-out
1	Thupten Palden	KU Leuven	Biocompatible solvometallurgical leaching methods for low-grade industrial process residues	vvv (RIA/IA, bilateral)	v	v	
2	Ioanna Maria Pateli	ULEIC	Ionometallurgical leaching of industrial process residues using deep-eutectic solvents	vvv (RIA/IA)	v	v	
3	Samant Nagraj	Metallo	Plasma-driven metal extraction from industrial process residues	v (RIA/IA)	vvv (Metallo)		
4	Pelin Altinkaya	Outotec	Hydrometallurgical process for recovery the critical and valuable metal recovery from complex impure process solutions	vv (RIA/IA)	vvv (Customers Outotec)	v	
5	Stylianos Spathariotis	ULEIC	Electrowinning of metals in deep-eutectic solvents	vvv (RIA/IA)	v	v	
6	Ivan Korolev	Outotec	Selective electrowinning of metals from complex impure solutions	vv (RIA/IA)	vvv (Customers Outotec)	v	
7	Vacant	KU Leuven	Ultrasound- and microwave-assisted non-aqueous solvent extraction in milliflow reactors	vvv (RIA/IA, EIT Upscaling)	v	v	
8	Giacomo Damilano	KU Leuven	Synthesis of extractants and ionic liquids from renewable chemicals	vvv (RIA/IA, bilateral)		vv	
9	Roberto Macchieraldo	UBO	Study of solvent miscibility by computational methods	vvv (RIA/IA)			

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10		UBO	In-silico design of selective metal extractants	vvv (RIA/IA)			
11	Jennifer Astoveza	Kerneos	Residual matrix valorisation as supplementary cementitious materials with calcium aluminate binders	vv (RIA/IA)	vvv (Kerneos + Customers Kerneos)		
12	Christina Siakati	KU Leuven	Iron-rich inorganic polymers derived from residual matrices	vvv (RIA/IA, EIT Upscaling)	v	vv	v
13	Vacant	UUtrecht	Valorisation of industrial process residues as heterogeneous catalysts	vv (RIA/IA)		vv	
14	Nikos Nikolopoulos	UUtrecht	Advanced characterisation of metal-containing, low-grade metallurgical residues	vvv (RIA/IA)			vv
15	Alejandro Abadías Llamas	Freiberg U.	Development of a comprehensive product-centric sustainability indicator framework	vvv (RIA/IA, EIT Upscaling)			v

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