

# The Future of Fully integrated human exposure assessment of chemicals:

Ensuring the long-term viability and technology transfer of the EU-funded 2-FUN tool as standardised solution



## THE CONTEXT

The exposure of human beings is an important part in the risk assessment of chemicals. Man can be exposed through the environment directly via inhalation, soil ingestion and dermal contact, and indirectly via food products and drinking water. Assessment of exposure concentrations can be done by measurement or by other means of estimation such as model-based computation.

The 2-FUN project, funded under the European Union's Sixth Framework Programme, produced a software containing advanced exposure assessment methodologies, coupling environmental multimedia and pharmacokinetic (PBPK) models. This software resulted to be an innovative and useful tool in order to assess human exposure to chemicals, but it was a 'prototype'.

The 4FUN project ([www.4funproject.eu](http://www.4funproject.eu)), funded under the European Union's Seventh Framework Programme, takes the results from the 2-FUN project to develop a standardised tool, MERLIN-Expo, which will be put on the market and disseminated to end-users (Figure 1).

## MERLIN-Expo:

- Integrates on the same platform both multimedia, PBPK and dose-response models in order to cover the whole exposure assessment chain (from concentrations in water, air and/or soil to internal dose to target organs and eventually pathology risks).
- Allows building complex scenarios involving several pollutant classes (pesticides, heavy metals, etc...) and media (river, soil, plants, human, etc...) in order to estimate their concentrations in different environmental, food, and human compartments.
- Enables to conduct lifetime risk assessments (not only daily intakes) for different human populations (e.g.: children at different ages, pregnant women, etc...) considering multiple exposure pathways.
- Has a complete documentation and trainings for users are provided (online and face to face)

## CONSORTIUM

The 4FUN consortium consists of 14 partners from 9 European countries and comprises SMEs, research organizations, large companies, non-governmental organization and a non-profit standardization organization.

## PROJECT OBJECTIVES

### Innovate and exploit the 2-FUN prototype software:

- analysis of the strengths, weaknesses, opportunities and threats (SWOT) of existing exposure assessment tools in order to identify gaps between current and desired conditions in exposure assessment
- analysis of case studies to improve the reliability of modelling estimations and to demonstrate the feasibility of building complex realistic scenarios.

### Create the standardised MERLIN-Expo tool:

- implementation of standardisation protocol to improve accuracy, precision and robustness of results
- development of standard documentation to reach a wide range of end-users and to support policy making.

### Transfer to stakeholders:

- release of the improved and standardised MERLIN-Expo tool
- delivery of supporting documentation
- organization of training courses for end-users in various European countries.

### Guarantee long term technical and economic viability:

- development of a sustainable business model.

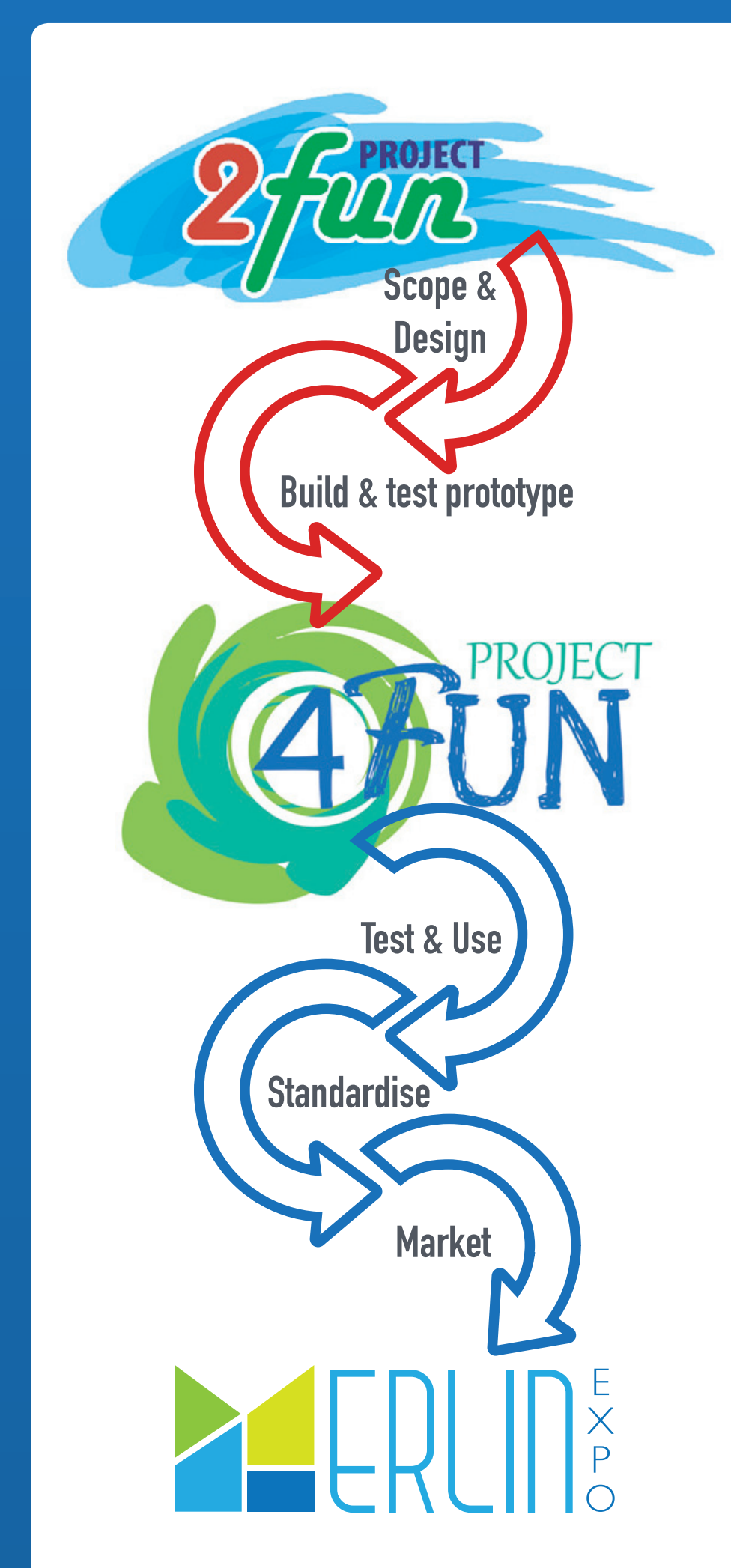


Figure 1

