



**TURNkey** - Towards more Earthquake-resilient Urban Societies through a Multi-sensor-based Information System enabling Earthquake Forecasting, Early Warning and Rapid Response actions

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821046



# TURNkey

## General Presentation

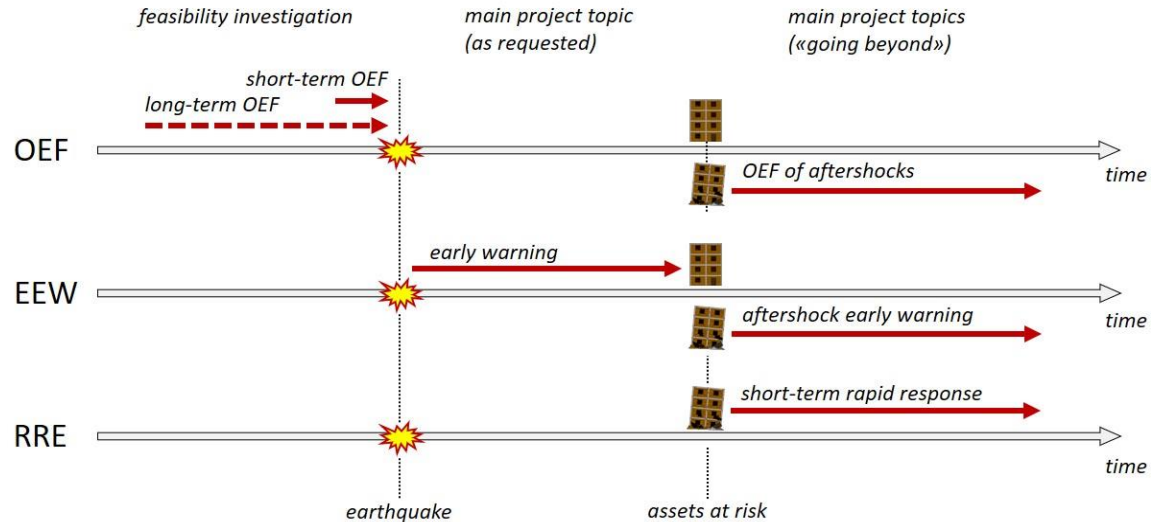
## Project Summary

- Topic:  
**SC5-17-2018: Towards operational forecasting of earthquakes and early warning capacity for more resilient societies**
- Type of action: **Research and Innovation Action (RIA)**
- Grant Agreement number: **821046**
- Duration: **36 months**
- Project Dates: **01/06/2019 – 31/05/2022**
- Maximum Grant Amount: **7,999,948.75 €**

# Objective of TURNkey

TURNkey aims to make significant advances in the fields of:

- Operational Earthquake Forecasting (OEF)
- Earthquake Early Warning (EEW)
- Rapid Response to Earthquakes (RRE)





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## Focus and Project Outcomes

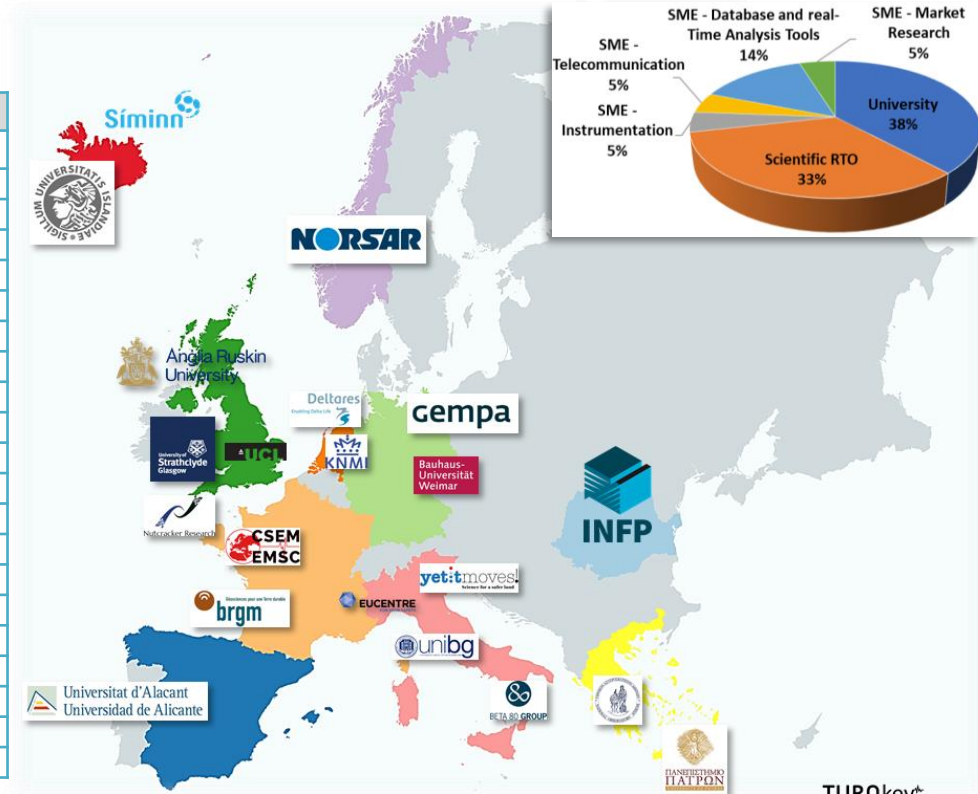
The focus of TURNkey is to close the gap between theoretical systems and their practical application in Europe in order to improve seismic resilience before, during and after a damaging earthquake .

The project outcomes are two fully-operational **TURNkey products** :

- **TURNkey low-cost multi-sensor units**
- **cloud-based TURNkey earthquake information system**

# Project Consortium

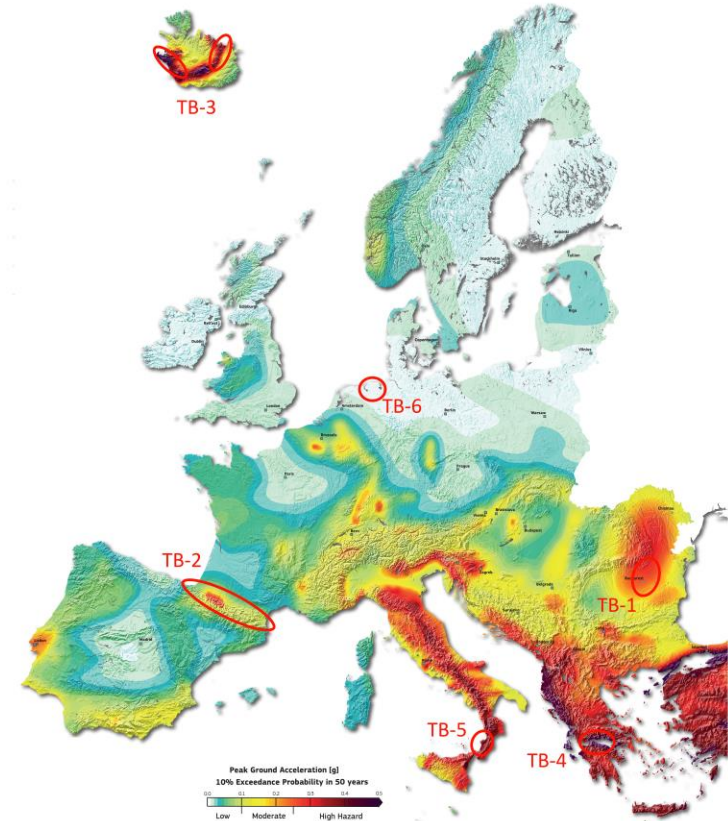
Participant organisation name	Country
Stiftelsen NORSAR	Norway
Stichting Deltares	Netherlands
Koninklijk Nederlands Meteorologisch Instituut	Netherlands
Bureau de Recherches Géologiques et Minières	France
Euro-Mediterranean Seismological Centre	France
Haskoli Islands (University of Iceland)	Iceland
Fondazione Eucentre	Italy
University of Strathclyde	UK
Bauhaus-Universität Weimar	Germany
Universidad de Alicante	Spain
Anglia Ruskin University Higher Education Corporation	UK
Università degli Studi di Bergamo	Italy
University College London	UK
Institutul National de Cercetare si Dezvoltare pentru Fizica Pamantului	Romania
YetItMoves S.r.l.	Italy
Gempa GmbH	Germany
National Observatory of Athens	Greece
Nutcracker Research Ltd.	UK
Beta 80 SpA	Italy
Siminn hf.	Iceland
Panepistimio Patron (University of Patras)	Greece



# Testbeds (TB)

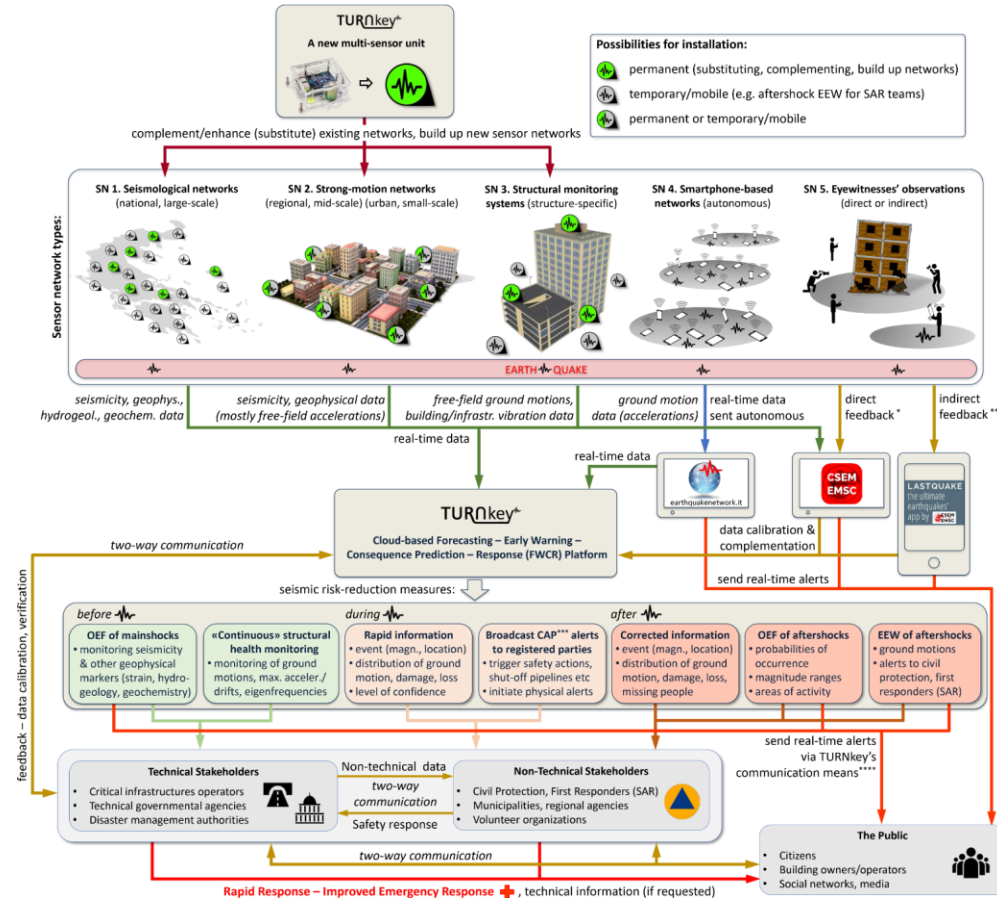
TURNkey will be demonstrated in six earthquake-prone areas in Europe, including areas affected by induced seismicity, collectively referred to as the European Testbeds (TB-1 to TB-6), a Worldwide TB-7, and a mobile European EEW unit for aftershocks TB-8

- TB-1: Bucharest, Romania
- TB-2: Pyrenees mountain range, France
- TB-3: Hveragerði (South Iceland) and Húsavík (North Iceland)
- TB-4: Patras and Aegio, Greece
- TB-5: Maritime ports in Gioia Tauro, Italy
- TB-6: Groningen province, Netherlands
- TB-7: any earthquake-affected area of Europe (World)
- TB-8: Mobile EEW for aftershocks any earthquake-affected area of Europe



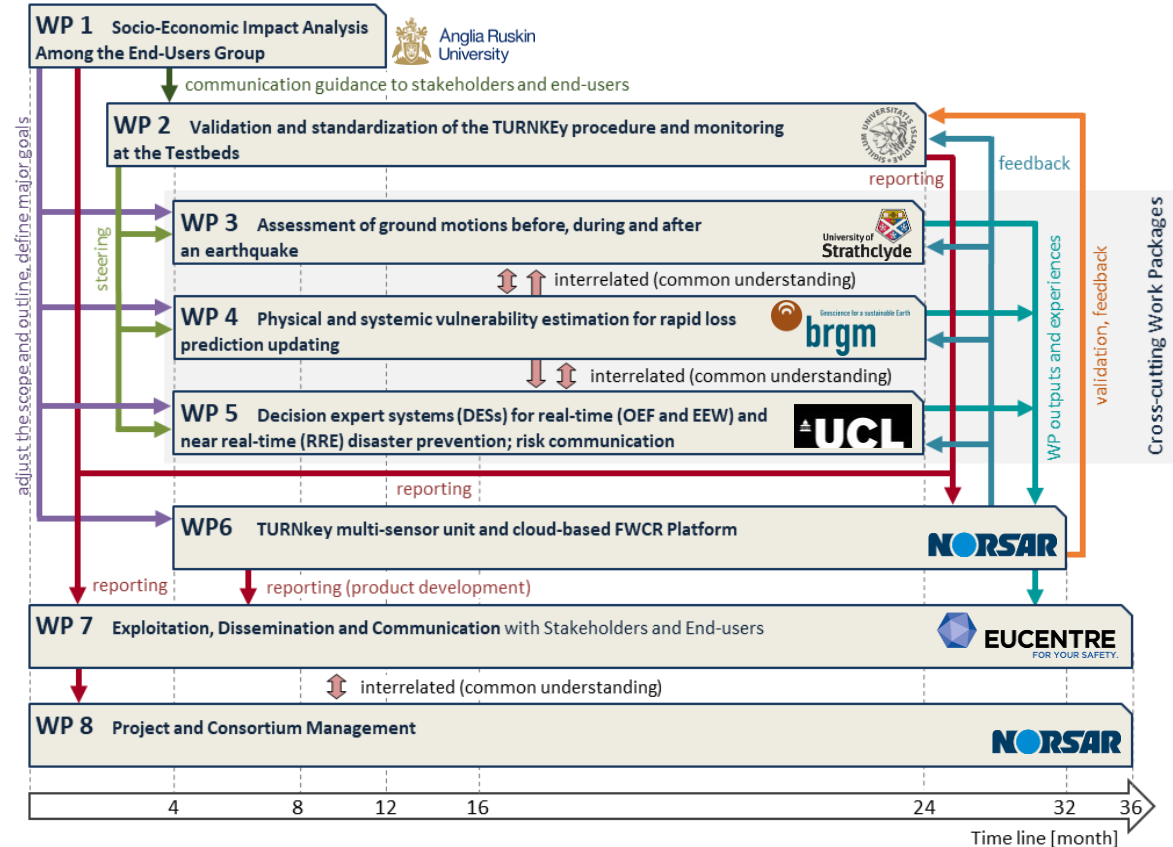
# TURNkey concept

- Develop the TURNkey FWCR (Forecasting – Early Warning – Consequence Prediction – Response) platform, a multi-sensor-based earthquake information system, facilitating Earthquake Forecasting and enabling Early Warning and Rapid Response actions
- Develop a versatile and cost-efficient TURNkey multi-sensor unit consisting of seismic (vibration) sensors optimized for EEW and GNSS receivers suitable for various monitoring tasks





# Work Packages





# Supporting partners – External Advisory Committee

TURNkey consortium will receive guidance and advice from a large number of experts of various competence at leading institutions from all over the world, and from the European Plate Observing System (EPOS)

