

# FITHydro

## Fish friendly Innovative Technologies for Hydropower

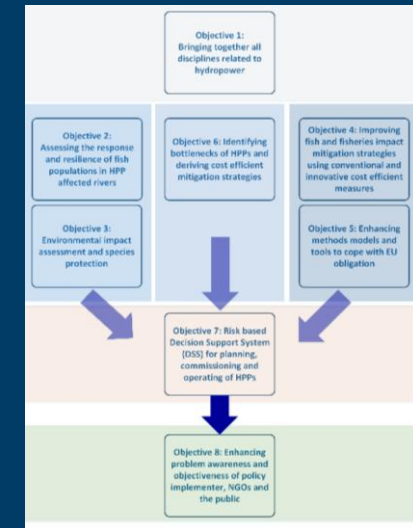


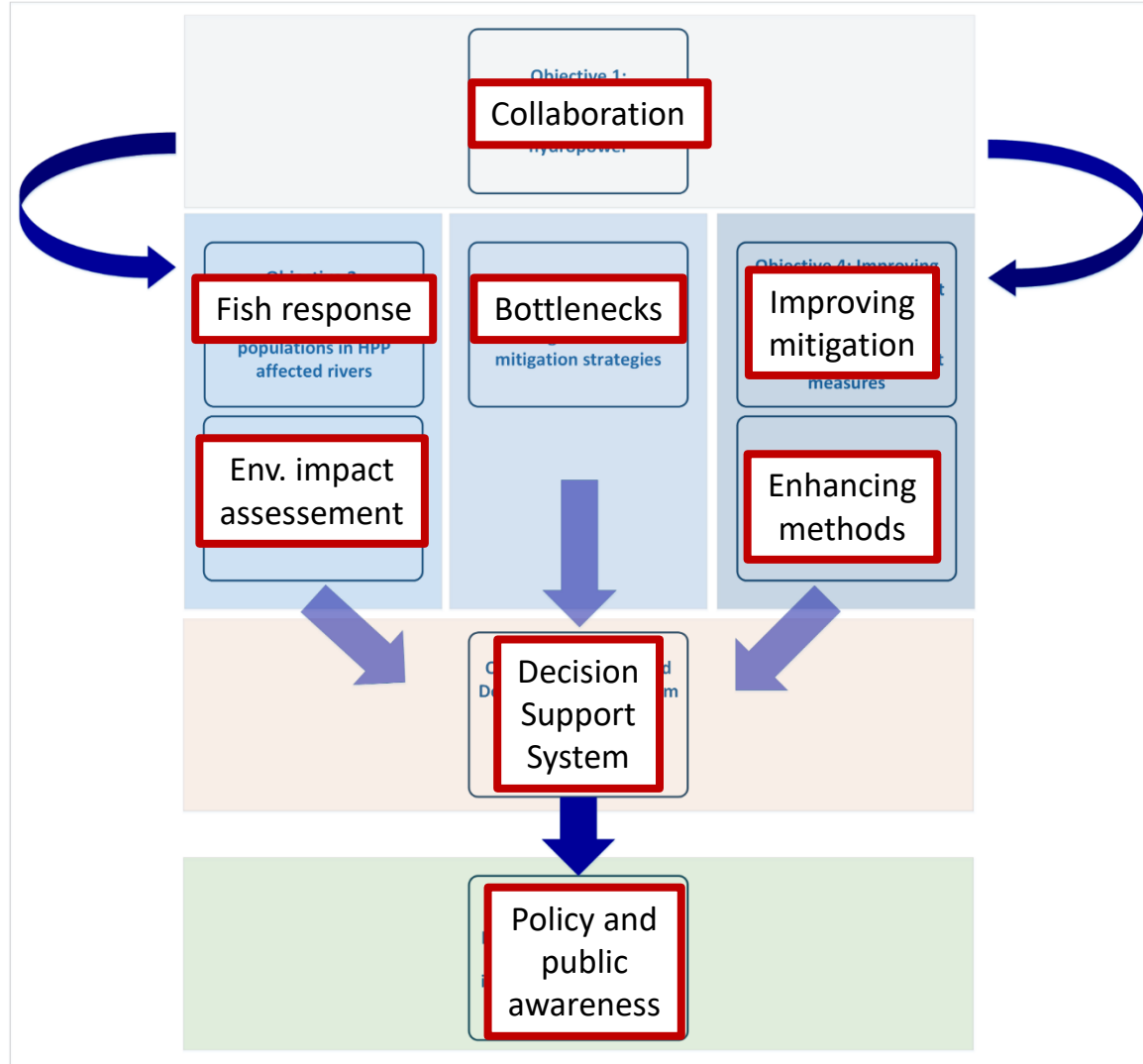
- CEDREN goes to Europe!
- Develop methods and test them in 13 Test Case Sites i 4 Focus Regions (2 in France)
- 26 partners from Germany, Portugal, France, Spain, UK, Switzerland, Estonia, Belgium, Austria and Norway
- SINTEF Energy Research, NTNU, Statkraft and Sweco from Norway



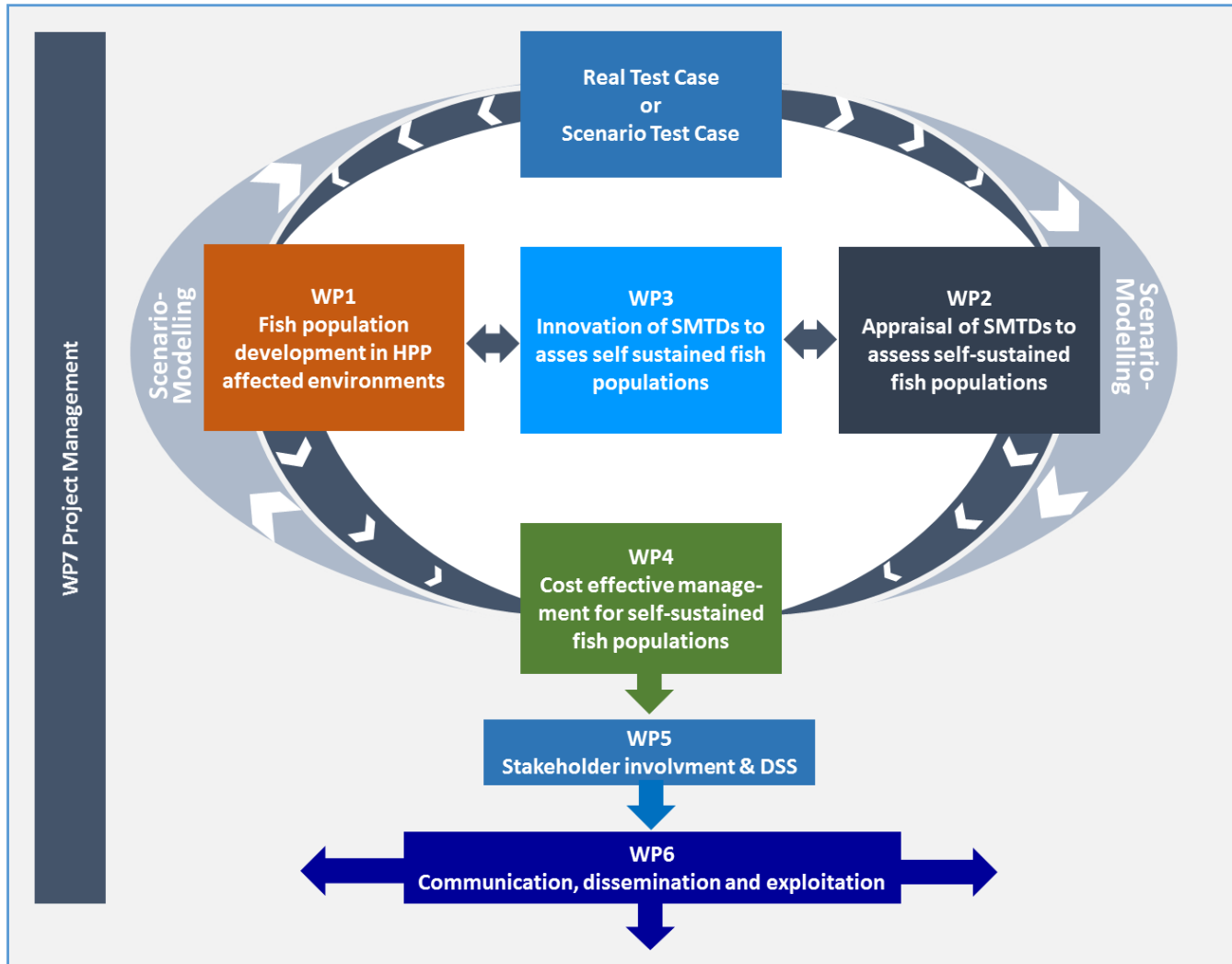
# Objectives

- Bringing together all disciplines related to hydropower
- Assessing the response and resilience of fish populations in HPP affected rivers
- Environmental impact assessment and species protection
- Improving fish and fisheries impact mitigation strategies using conventional and innovative cost efficient measures
- Enhancing methods models and tools to cope with EU obligation
- Identifying bottlenecks of HPPs and deriving cost efficient mitigation strategies
- Risk based Decision Support System (DSS) for planning, commissioning and operating of HPPs
- Enhancing problem awareness and objectiveness of policy implementer, NGOs and the public






**FIThydro**  
Objectives



# FME HydroCen

- One og eight granted centres in the period 2017-2024.

 Forskningsrådet



NORWEGIAN RESEARCH CENTRE FOR  
HYDROPOWER TECHNOLOGY

 NTNU



# HydroCen

NORWEGIAN RESEARCH CENTRE  
FOR HYDROPOWER TECHNOLOGY

**384 Mnok**

**8 years**

Research Council of Norway

192 Mnok

Industry

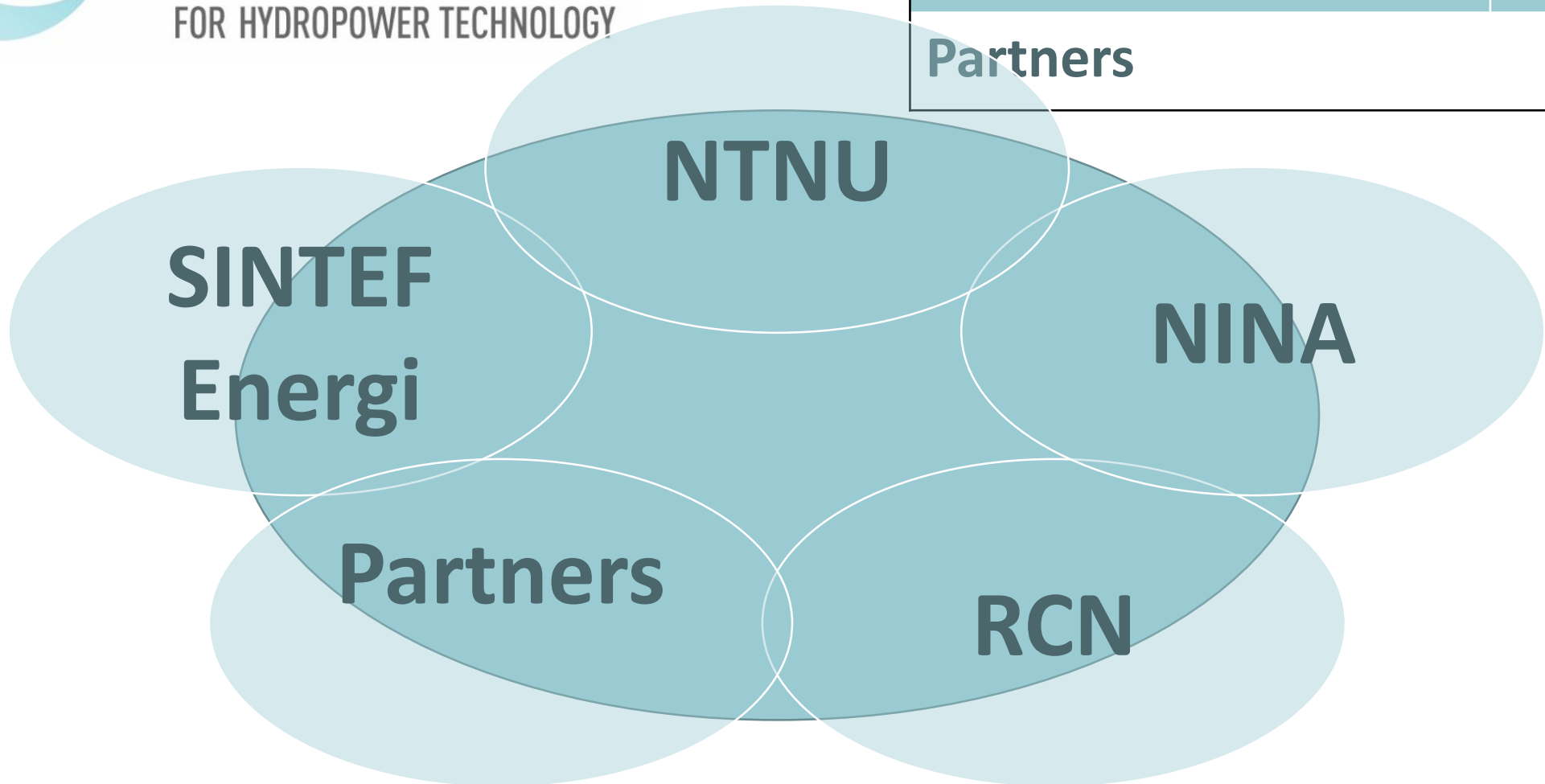
96 Mnok

R&D

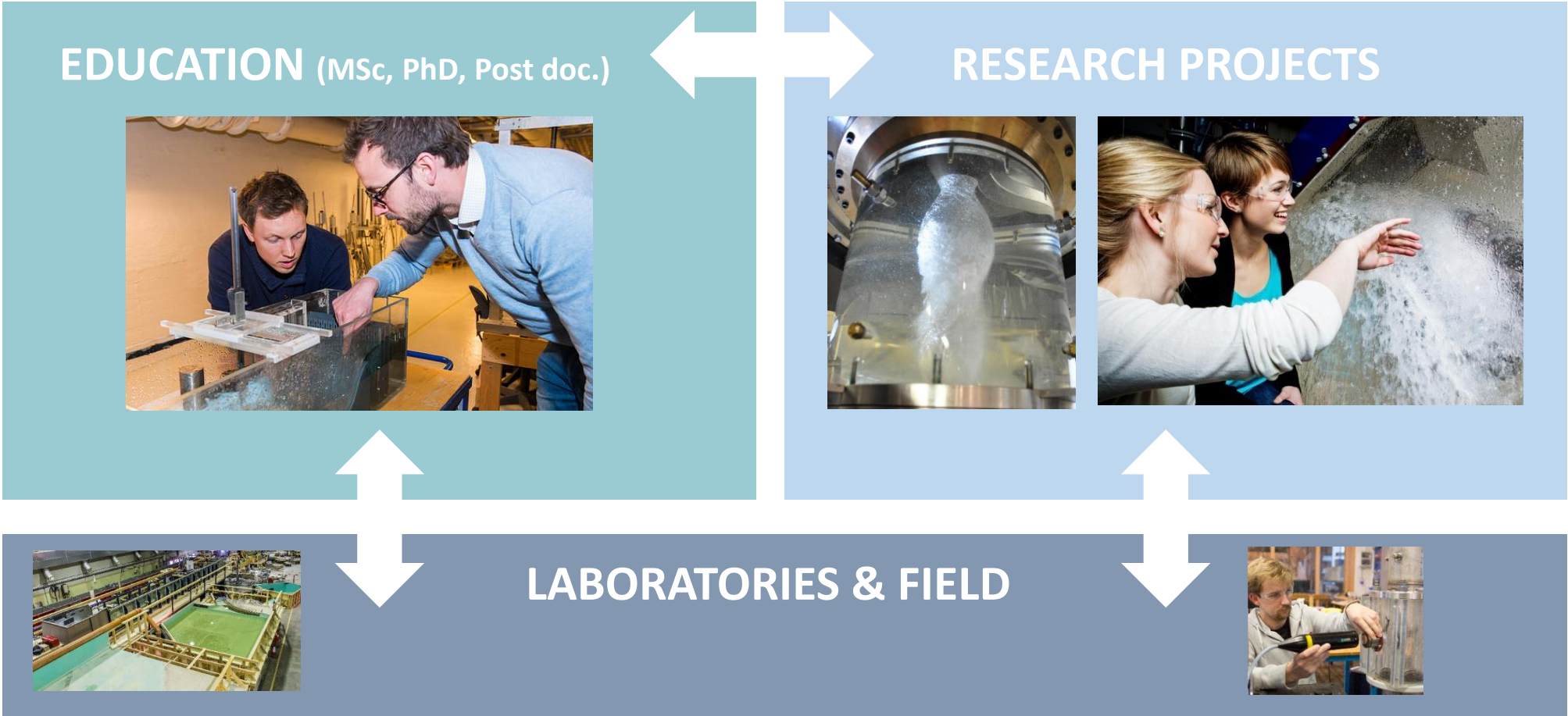
96 Mnok

**Partners**

**41**



# Three action areas



# WP 1 HYDROPOWER STRUCTURES

Leif Lia (NTNU)

Foto: Multiconsult



Foto: Norconsult



Illustrasjon: Kaspar Vereide, NTNU

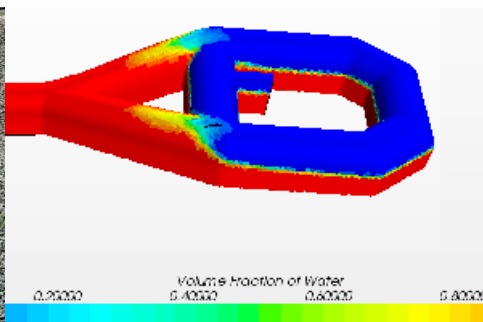


Foto: Marius Madsen



# WP 2 TURBINE & GENERATOR

Arne Nysveen (NTNU)

Foto: Rainpower



Foto: Helge Hansen/BKK



Foto: E-CO

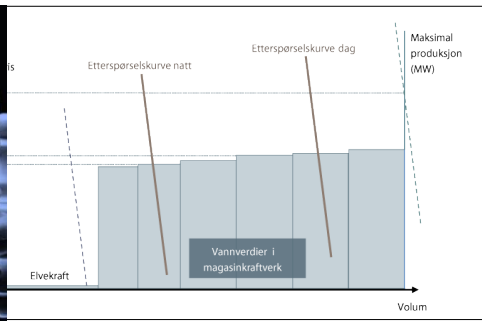
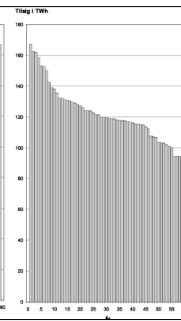
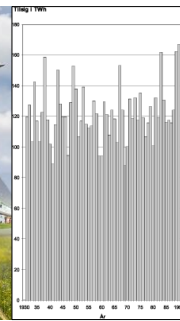
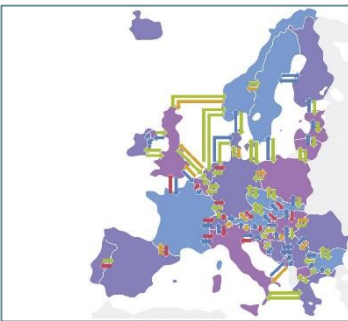


Foto: Elkem ASA



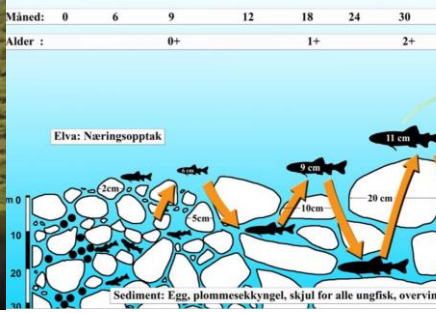
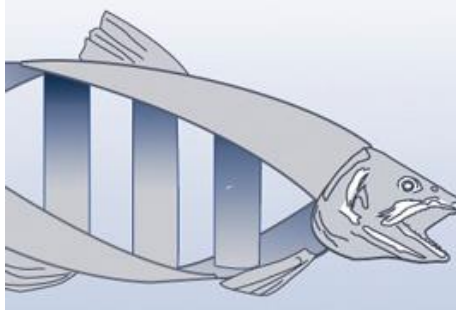
# WP 3 MARKET & SERVICES

Birger Mo (Sintef)



# WP 4 ENVIRONMENTAL DESIGN

Torbjørn Forseth (NINA)



Videostills CEDREN

Illustrasjon: Ulrich Pulg, UNI Miljø

Foto: Halldor Kolbeins



## WP 4

### Project 4.1: **Realizing value added environmental solutions**

#### **Objective:**

The main objective of project 4.1. is to explore instruments for minimizing the local ecological footprint of hydropower production through analyses of mitigation efforts, funding schemes, consumer preferences and industrial innovations aimed at promoting added value by environmental design solutions.

During 2018 the activity 4.1.1 will be executed:

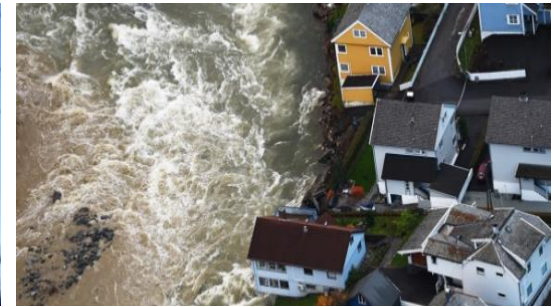
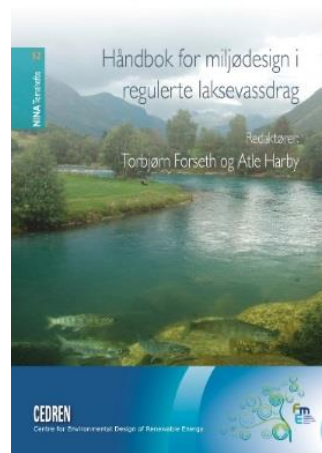
#### **Objective – sub-project 4.1.1**

Mapping of public and public-private governance schemes, management practices, trade-offs and funding mechanisms in Europe aimed at promoting societally beneficial environmental solutions

#### This will be done through the following Milestones:

- Desk top studies of the regulatory situation and policy schemes in relevant European countries
- Internal workshop with key personnel for the specification and execution of the European mapping
- Mapping of the European situation – interviews etc.
- Preparation of the findings and dialogue with technical committee
- Evaluation of initial results from A4.1.1. and dialogue with the Technical Committee regarding further research activities
- “Next step” work plan for research activities in project 4.1

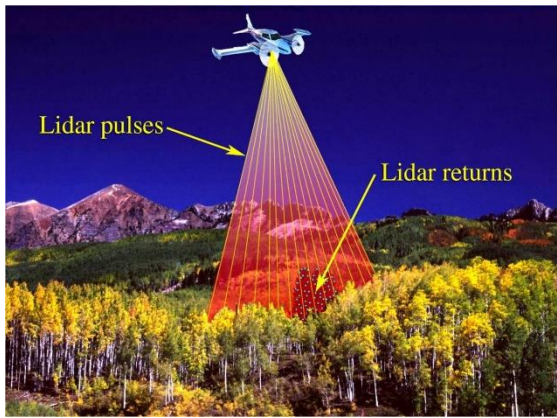
HydroCen WP4.3 will expand the concept of «environmental design in regulated salmon rivers» to new species, other ecosystem components. In addition, the concept will also be further developed to include user interests like leisure activities, sport fishing, kayaking and services like different energy services and flood protection.



Environmental design in salmon rivers (CEDREN)

### WP 4.3:

- Use existing and new characterization tools for river typology with regards to hydro-morphology, biogeography, services and user interests to identify 4-5 major Norwegian regulated river typologies for which the environmental design concept will be developed through case studies.
- Develop tools, methods and indicators for characterization of biodiversity, services and user interest in regulated rivers
- Develop and test methods for environmental flow settings in the major river typologies
- Develop tools for handling services and multi-use interest within the environmental design concept for each typology with regards to habitat and water use measures.
- Develop and test mitigation measures in reservoirs and rivers with flexible operational regimes
- Inclusion of environmental constraints in hydropower operation and scheduling models

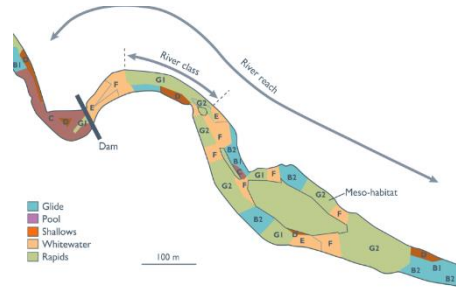


grønn laser



kart, databaser

Vi skal bruke innovative metoder som bruk av fjernmåling og miljøDNA koblet mot kart, databaser og metodikk fra miljødesign i CEDREN



miljøDNA



energiprodukter

