

# INNOVATING WITH NATURE

**Nature-based solutions** are designed to bring more nature and natural features and processes to cities, landscapes and seascapes. These innovative solutions also support economic growth, create jobs and enhance our well-being.



## CHALLENGES

**CLIMATE CHANGE AND ENERGY**

1980-2010  
**EUROPE LOST €300 billion** due to storms, landslides, floods, mud flows

There is high confidence that these losses will increase in the long term

**BUILDINGS**  
**35%** of the EU's CO<sub>2</sub> emissions  
**40%** of energy consumption

**UNSUSTAINABLE & UNHEALTHY CITIES**

1980-2010  
**75,000 DEATHS** in the EU due to heatwaves  
**= 67%** of all deaths from natural disasters

More Europeans may be impacted by heat waves until 2040, particularly in terms of health and well-being

2012  
**AIR POLLUTION**  
 fine particles in the air cause **~4 million** premature deaths worldwide

**DEGRADATION OF ECOSYSTEMS**

2011-2020  
 up to **€50 billion/year**  
 = **EU OPPORTUNITY COST** of not halting biodiversity loss and degradation of ecosystem services

Degradation of ecosystems = **LESS WATER PURIFICATION**

Globally, **20%** of urban drinking water is polluted

Currently, **emissions from drained peatlands** = **5%** of total global anthropogenic greenhouse gas emissions

## INVESTING IN NATURE CAN PROVIDE EFFECTIVE SOLUTIONS

- sustainable
- resilient to change
- contribute to green growth
- create new jobs

**INCREASE RESILIENCE**

Green roofs can cool buildings in the summer and prevent heat loss in the winter

**-10%** energy use

European market for green roofs  
**+ €380m sales**  
**+ 11m m<sup>2</sup> yearly**

**FLOOD RISK REDUCTION**  
 Green infrastructure can reduce flood risks

**Malmö, Sweden**

The city invested in sustainable urban regeneration, and installed green roofs and an open storm water system

**-50%** run-off ↓ **less flood damage**

**-20%** environmental impact

**+50%** biodiversity

**30%** unemployment to **6%**

**DECREASE URBAN HEAT STRESS**

Trees, green space and vegetation can attenuate urban heat stress and reduce temperatures by **up to 13°C** compared to full sunlight

pilot study in Manchester, UK

**IMPROVE AIR QUALITY**  
 HEALTH AND WELL-BEING

Trees and green walls can halve the amount of health threatening particles in the air

**10% more urban green space**

can reduce health care and sick leave costs by **€400m/year** per 10m inhabitants

study done in Amsterdam

**ENSURE WELL FUNCTIONING ECOSYSTEMS**

Restoration and preservation of ecosystems can provide very high returns on investment and help to avoid costs of expensive infrastructure

**EFFECTIVE CO<sub>2</sub> STORAGE**

**Northern Germany**

**RESTORING 10% OF DRAINED PEATLANDS**  
 avoids damages worth **€22m/year** from CO<sub>2</sub> emissions

**WATER SUPPLY AND PURIFICATION**

**North Western England**

**RECOVERING PEATLANDS**  
 is estimated to achieve **~€3m/year** of saved water supply and purification costs

**Vienna**

**32,000ha of forests**  
 Schneealpe mountains eliminating the need for a water treatment plant

Planning, developing, implementing and monitoring these nature-based solutions needs a high as well as low-skilled workforce. Investing in nature-based solutions creates more sustainable jobs: Environment and energy efficient jobs in the EU increased by 20% during the recession (2007-2011).

## EU RESEARCH AND INNOVATION IN NATURE-BASED SOLUTIONS THROUGH HORIZON 2020

**€120m** in 2016-17 for 'Innovating with Nature' research and innovation activities in cities and rural areas

= open access to evidence and data to support and stimulate public and private investment

**LARGE-SCALE DEMONSTRATION PROJECTS**  
 living labs connect researchers, public authorities, businesses, industry, local communities

**CO-DESIGN, MUTUAL LEARNING**  
 local, regional and national decision-makers, researchers, private investors, businesses and industry and citizens will be encouraged to collaborate, design and implement innovative solutions

### EXAMPLES

**TURAS SUSTAINABLE CITIES**

- green walls and roofs
- urban brownfields
- social agriculture
- biomimicry – innovation inspired by nature
- novel design

<http://goo.gl/SCGsqv>

**GREEN SURGE MAJOR URBAN CHALLENGES**

- identifies, develops and tests ways to link green spaces, biodiversity, people and the green economy

<http://goo.gl/c2ZsI5>

**OPERAs ECOSYSTEM SCIENCE FOR POLICY & PRACTICE**

- applies nature-based solutions in the real world: e.g. urban hybrid dunes for storm and coastal protection, recreation and biodiversity conservation

<http://goo.gl/8EqrLD>



Find out more about nature-based solutions: <https://goo.gl/Hf23xb>