iSCAPE

improving the Smart Control of Air Pollution in Europe

Smart community approaches to reduce air pollution in European cities

Dr Francesco Pilla

Spatial Dynamics Lab

francesco.pilla@ucd.ie

15 Partners

6 Cities

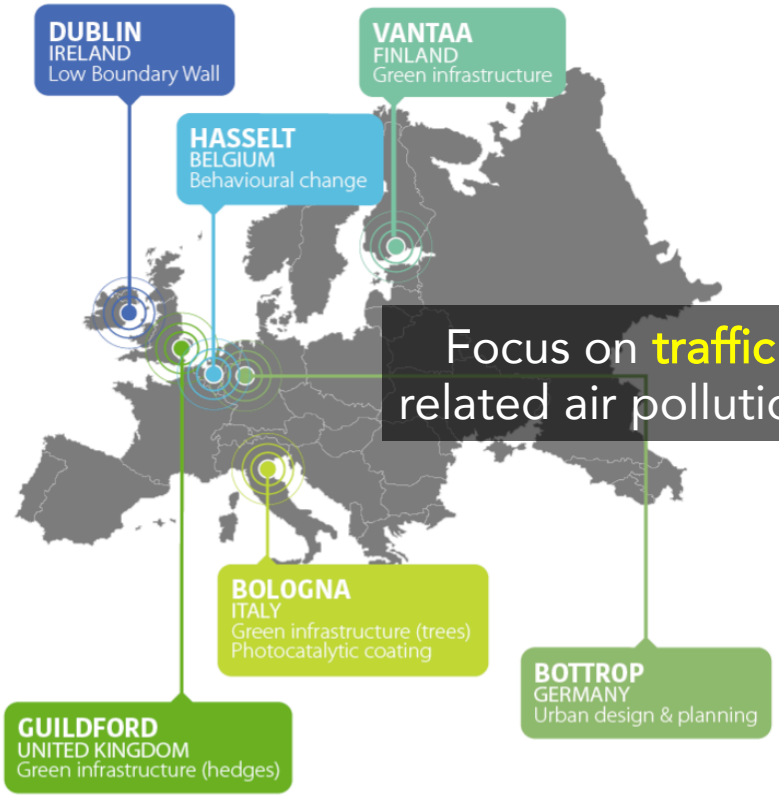
3 Years

1 Goal

European Commission

iSCAPE LIVING LABS & PILOT PROJECTS

Sep, 2016 - Aug, 2019



Focus on **traffic** related air pollution

THE OVERALL OBJECTIVE is to develop an integrated strategy for air pollution control in European cities that is grounded on evidence-based analysis.

iSCAPE AIMS at reducing urban pollution and climate change negative impacts by leveraging:

PASSIVE CONTROL SYSTEMS

- **affect air pollution dispersion:** trees, hedges, green walls & roofs, low boundary walls, photocatalytic coating

BEHAVIOURAL CHANGE

- **reduce emissions**

IMPACT & EXPECTED OUTCOMES

Health Benefits

Decreased Pollution

Lower Cost Solutions

Evidence Based Data

IMPROVING THE SMART CONTROL OF AIR POLLUTION IN EUROPE

PASSIVE CONTROL SYSTEMS

Move away air pollution

BEHAVIOURAL CHANGE

Produce less air pollution

LIVING LAB APPROACH

- Active user involvement
- Real-life setting
- Multi-stakeholder participation
- Multi-method approach
- Co-creation

iSCAPE CITIES

LIVING LAB PROJECTS	SENSING TECHNOLOGIES	RESEARCH
Innovation development Citizen engagement	Living lab stations Citizen kits	Scientific literature review & assessment Monitoring Simulations
Exiting ideas Promising solutions	Lower cost solutions	Scientifically validated results Evidence based data

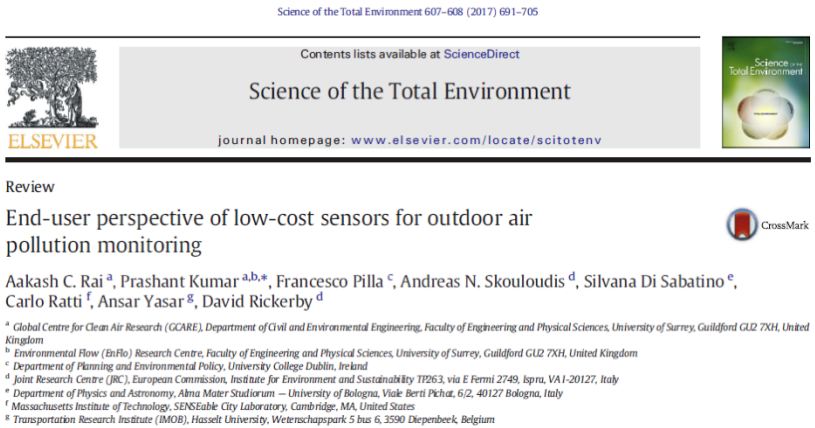
Co-design solutions to traffic related air pollution in **Living Labs** then validate them with models and measurements

iSCAPE IMPACT

- Decreased pollution
- Heath benefits
- Increased awareness

COMMUNICATION & DISSEMINATION, EXPLOITATION

Impacts on policy



Science of the Total Environment 607–608 (2017) 691–705

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Review

End-user perspective of low-cost sensors for outdoor air pollution monitoring

Aakash C. Rai [a], Prashant Kumar [a,b,*], Francesco Pilla [c], Andreas N. Skouloudis [d], Silvana Di Sabatino [e], Carlo Ratti [f], Ansar Yasar [g], David Rickerby [d]

[a] Global Centre for Clean Air Research (GCARE), Department of Civil and Environmental Engineering, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford GU2 7XH, United Kingdom
[b] Environmental Flow (EnFlo) Research Centre, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford GU2 7XH, United Kingdom
[c] Department of Planning and Environmental Policy, University College Dublin, Ireland
[d] Joint Research Centre (JRC), European Commission, Institute for Environment and Sustainability TP263, via E Fermi 2749, Ispra, VA I-20127, Italy
[e] Department of Physics and Astronomy, Alma Mater Studiorum – University of Bologna, Viale Berti Pichat, 6/2, 40127 Bologna, Italy
[f] Massachusetts Institute of Technology, SENSEable City Laboratory, Cambridge, MA, United States
[g] Transportation Research Institute (IMOB), Hasselt University, Wetenschapspark 5 bus 6, 3590 Diepenbeek, Belgium

Guidelines on use for green infrastructure produced for City Hall, London

Atmospheric Environment 162 (2017) 71–86

Contents lists available at ScienceDirect

Atmospheric Environment

journal homepage: www.elsevier.com/locate/atmosenv

Review article

Air pollution abatement performances of green infrastructure in open road and built-up street canyon environments – A review

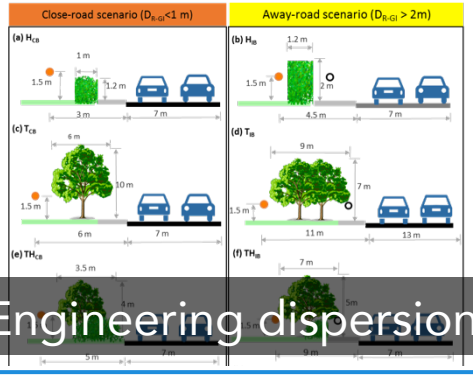
K.V. Abhijith [a], Prashant Kumar [a, b, *], John Gallagher [c, d], Aonghus McNabola [c], Richard Baldauf [e, f], Francesco Pilla [g], Brian Broderick [c], Silvana Di Sabatino [h], Beatrice Pulvirenti [i]

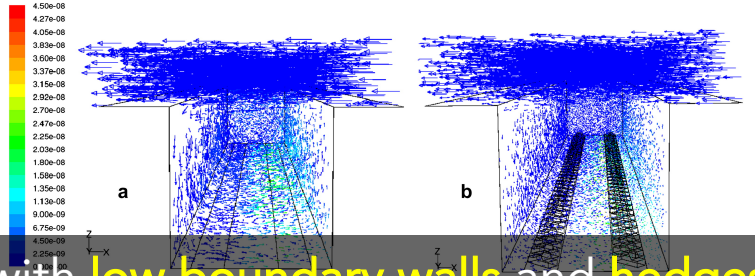
[a] Global Centre for Clean Air Research (GCARE), Department of Civil and Environmental Engineering, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford GU2 7XH, United Kingdom
[b] Environmental Flow (EnFlo) Research Centre, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford GU2 7XH, United Kingdom
[c] Department of Civil, Structural & Environmental Engineering, Trinity College Dublin, Dublin, Ireland
[d] School of Environment, Natural Resources & Geography, Bangor University, Bangor LL57 2UW, United Kingdom
[e] U.S. Environmental Protection Agency, Office of Research and Development, Research Triangle Park, NC, USA
[f] U.S. Environmental Protection Agency, Office of Transportation and Air Quality, Ann Arbor, MI, USA
[g] Department of Planning and Environmental Policy, University College Dublin, Dublin, D14, Ireland
[h] Department of Physics and Astronomy, Alma Mater Studiorum - University of Bologna, Viale Berti Pichat 6/2, 40127 Bologna, Italy
[i] Dipartimento di Ingegneria Energetica, Nucleare e del Controllo Ambientale, University of Bologna, Bologna, Italy

DEFRA (UK) recommended read for low cost air pollution sensing

Passive Control Systems:
Engineering dispersion of pollutants at scale

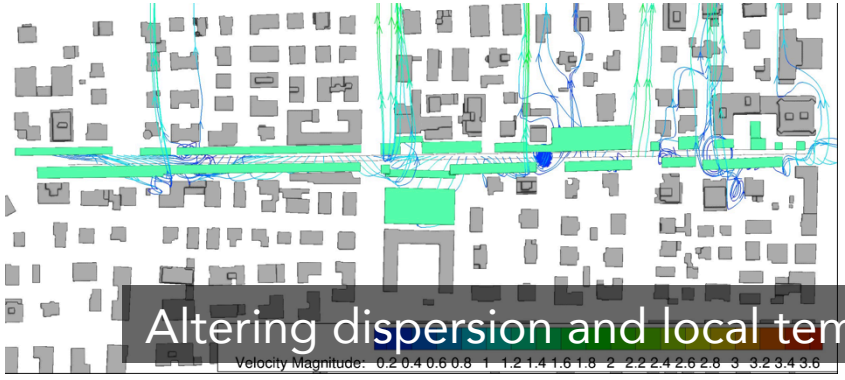
Street scale

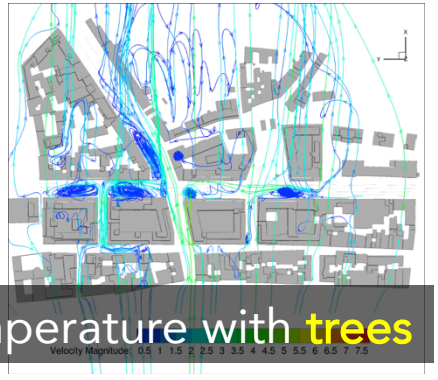




Engineering dispersion with low boundary walls and hedges

Neighbourhood scale





Altering dispersion and local temperature with trees

Urban scale

Affecting ventilation and urban heat island with urban design

iSCAPE sensors:
Assessing interventions and engaging citizens

Monitoring interventions

Engaging citizens

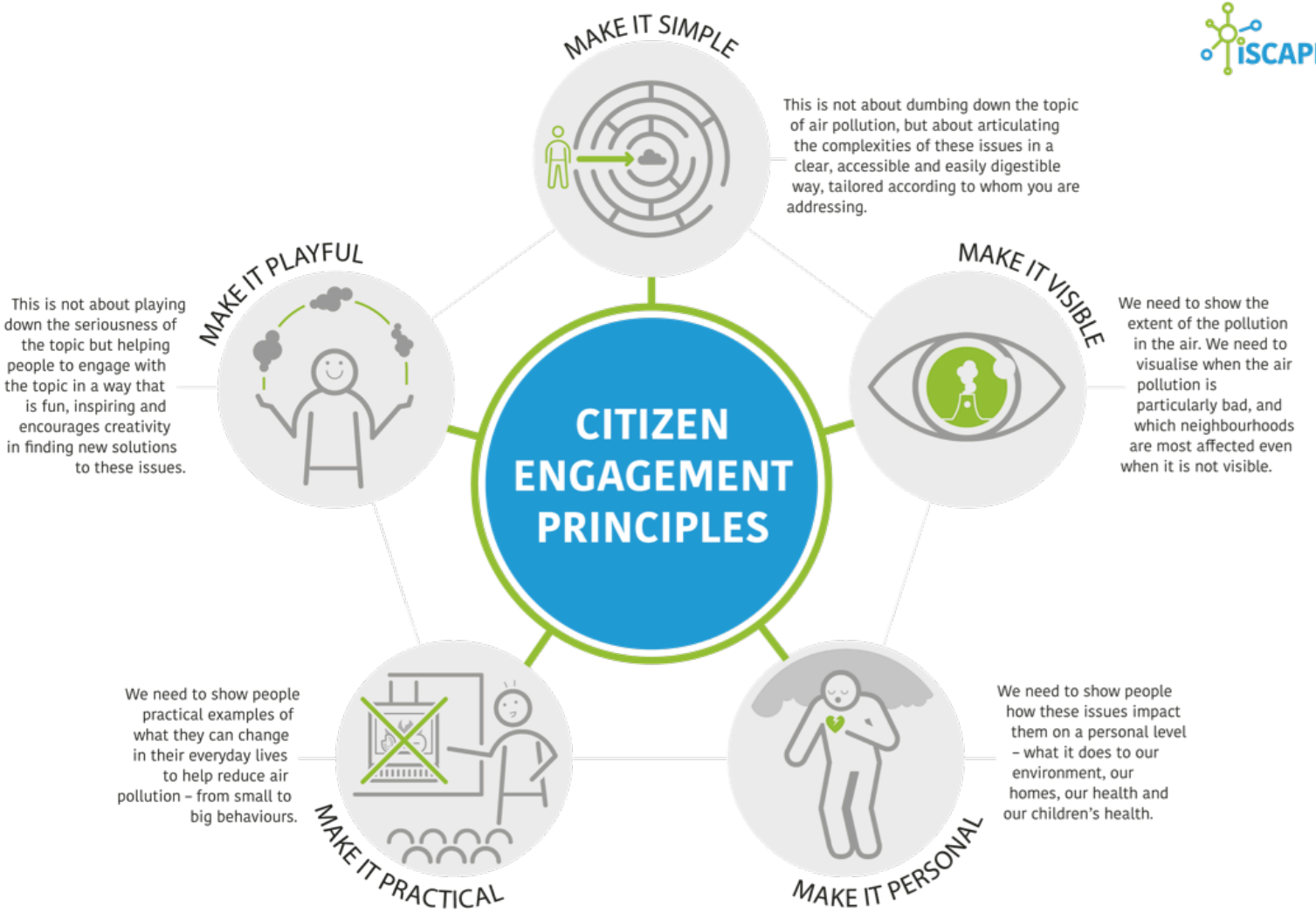
Provide citizens with a **way to "see"** air pollution

iSCAPE LIVING LABS: THREE KEY PRINCIPLES

Co-design solutions with a **wide range of stakeholders** to maximise impact and remove barriers

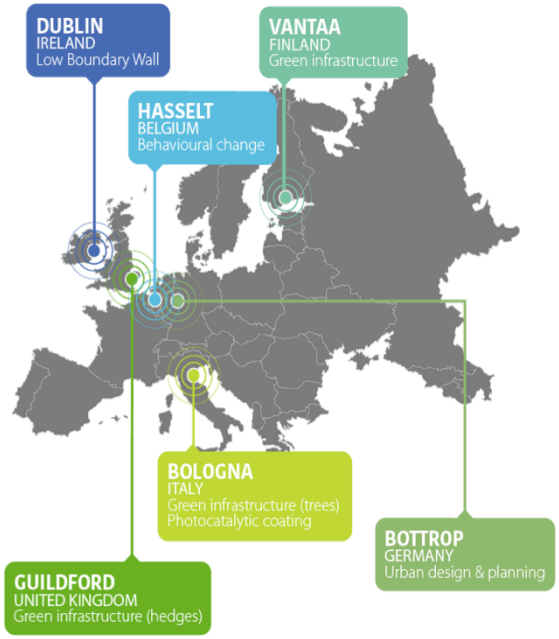
iSCAPE Living Labs

Smart approaches to reduce emissions



iSCAPE Living Labs

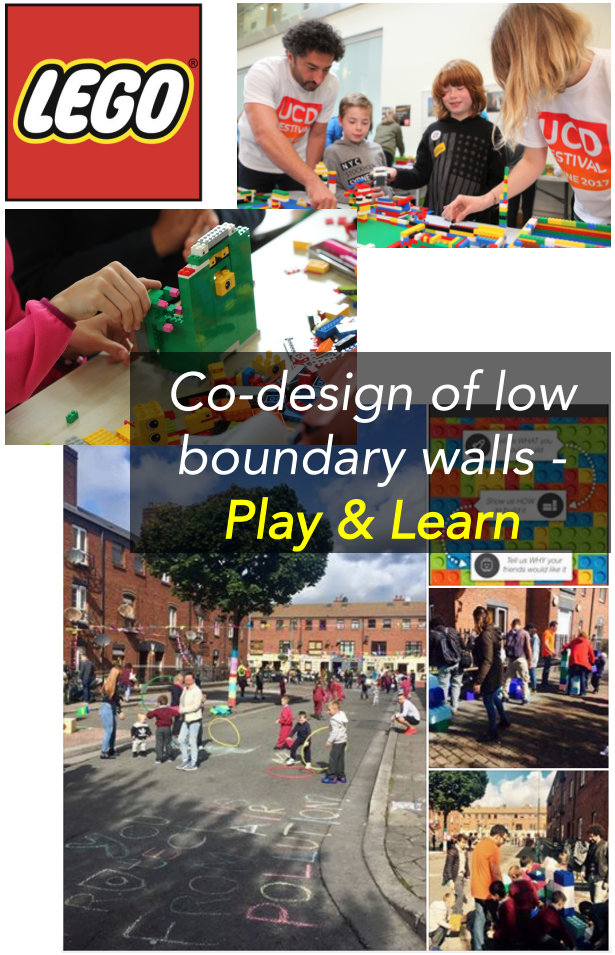
*Sometimes **SMART** has nothing to do with technology…*



Bottrop Living Lab

*Co-design of urban planning solutions – **Planning Games** & **Wandering Trees***

Dublin Living Lab



*Co-design of low boundary walls - **Play & Learn***

Let's keep cities breathing!

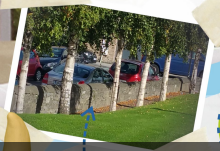
There are lots of ways to make city air cleaner. Dr Francesco Pilla in University College Dublin is working on a project called iSCAPE, to help cities breathe!

The iSCAPE project is working with people living in six cities across Europe, including Dublin, to test out ways of reducing air pollution.

Dr Francesco Pilla

Francesco: "In Ireland, air pollution in cities mainly comes from two places: from burning fires at home and from driving cars that use petrol or diesel. My lab is working with people to figure out how we can reduce air pollution and also how we can help to stop dirty air making people sick."

Francesco: "One way we can help to keep polluted air away from people is to use low walls and hedges near busy roads. The walls or hedges are a barrier to air moving over to the pavement or houses where people are. Hedges are really good, because they are like living filters for dirty air and their leaves produce oxygen that we can breathe."



Air pollution is a big problem. One in every eight deaths around the world is linked to air pollution!

Rachel Mulligan
Wonder Panel Member

low boundary wall

Be air aware!

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Focus on our **future citizens** to drive the change towards a more sustainable behaviour

Air pollution is a big problem, but you can help! Take a look at some of the things you can you do to keep the air clean and protect yourself from air pollution.

Air Pollution from a car exhaust

Cool it on the car!

Sometimes you need to take a car to get somewhere, but if your car uses petrol or diesel that will pollute the air. Stop and think if you really need to take the car. Could you walk or cycle or go on your scooter? Or get a bus or train?

Plant trees and hedges!

Trees and hedges can work as filters to clean the air. Try to have plants growing around your house, your school and your area. They will help to keep us healthy, they provide a home, food and shelter for animals and they look great too!

Walk behind walls!

Scientists at the iSCAPE project have been discovering that if you need to walk near a busy road, then having a low wall or hedge between you and the busy road means you breathe less pollution into your lungs. So plan clean-air routes!

Bring down the burn!

Burning wood, coal or peat in fires sends small polluting particles up into the air. The best way to reduce this is to stop burning wood, peat and coal. If that is not possible, then try to use an eco-stove that is designed to reduce pollution, rather than a standard stove or an open fire.

Recycle!

When we don't recycle rubbish, it can get sent buried in big dumps under the ground called 'landfills'. As the rubbish rots, it releases gases, including the greenhouse gas methane. So be sure to recycle all the food, paper, plastic and clothes that you can, to stop them going into landfills.

Pile of domestic refuse in landfill site

As kids, you can help protect the planet for today and for the future. For more,

SCIENCE APPRENTICE

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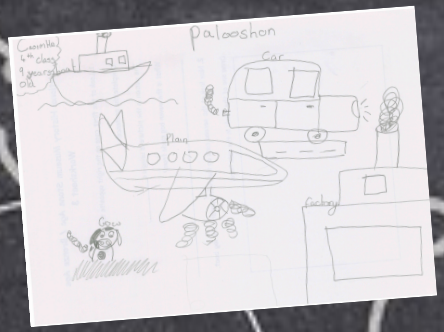
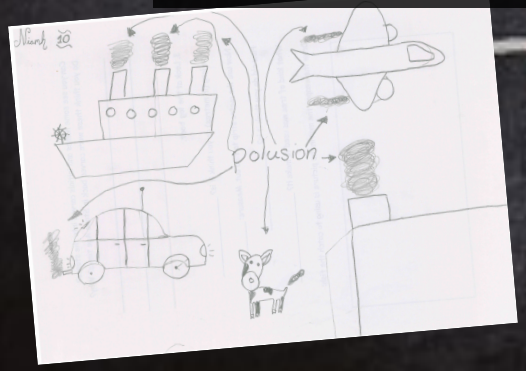
Co-designing solutions to air pollution with primary school children via Design Thinking workshops and LEGO

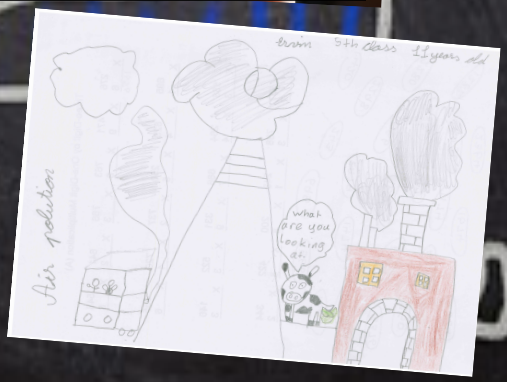













EU Website: https://www.iscapeproject.eu/

Living Labs websites: http://livinglabs.iscapeproject.eu/

Leaflet: https://www.iscapeproject.eu/wp-content/uploads/2017/11/iSCAPE_leaflet.pdf

Email: francesco.pilla@ucd.ie