Please check our wiki for help on navigating the form.

Horizon 2020

Call: H2020-LC-CLA-2018-2019-2020

(Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement)

Topic: LC-CLA-10-2020

Type of action: RIA

Proposal number: SEP-210650053

Proposal acronym: DESIRE

Deadline Id: H2020-LC-CLA-2020-2

Table of contents

How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the steps in the submission wizard.

1 - General information

Topic	LC-CLA-10-2020	Type of Action	RIA
Call Identifier	H2020-LC-CLA-2018-2019-2020	Deadline Id	H2020-LC-CLA-2020-2

Acronym	DESIRE
Proposal title	A citizen-oriented integrative assessment of climate action, aiming to explore, co-create and foster engagement, lifestyle changes and convergences

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months	*36*
Fixed keyword 1	Decarbonisation and lifestyle changes
Fixed keyword 2	Social innovation
Fixed keyword 3	Climate change mitigation
Fixed keyword 4	Low/zero carbon communities
Fixed keyword 5	Gender in environmental sciences
Fixed keyword 6	Science underpinning the preparations of NDCs after the 2023 Glo
Free keywords	*integrated assessment modelling; gamification; agent-based modelling; lifestyle changes; deliberative democracy; intentional communities; social acceptance; citizen engagement; climate change*

Abstract

Acknowledging the importance of citizen engagement and the role of societal acceptance and uptake of technologies, as well as the decarbonisation potential of shifting lifestyle patterns in climate action, DESIRE will delve into the role of individuals, households, communities and institutions in the required societal, technological and energy transitions necessary.
It will aim to gain a better understanding of the core components of social innovation at the citizen level, through initiative-based learning, citizen sciences, gamification, and social innovation analysis. It will explore innovation at the household, community and sectoral level, by identifying enablers of and barriers to various dimensions of transition from citizens' perspectives across communities; and employ in-depth case studies to better appreciate the local context towards exploring lessons in, up-scale potential of and factors hampering existing sustainable lifestyles within intentional communities worldwide.
Bridging the local-level perspective with a novel quantitative systems modelling component, it will explore lifestyle-driven scenarios, featuring different levels of technological availability and diffusion, coupled with different levels of behaviour change and access to new services. Based on a core ensemble of integrated assessment models, it will explore the diverse socioeconomic impacts and costs of structural changes, such as those implied in a world of varying shifts between ownership and sharing, and the implications of digitalisation for energy demand, including replacement of services by smart devices and demand of emerging services. Without anchoring to optimising behaviours, it will perform sectoral analyses to simulate trends on and capture impacts from shifting energy demand; and employ agent-based models to simulate purchasing decisions, as well as demand-side management models to explore reward-driven household innovations, considering direct and indirect rebound effects.

Remaining characters 1

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under Horizon 2020 or any other EU programme(s)? ○ Yes ◉ No

Please give the proposal reference or contract number.	
xxxxxx-x	

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	☒
2) The information contained in this proposal is correct and complete.	☒
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	☒

4) The coordinator confirms:

- to have carried out the self-check of the financial capacity of the organisation on http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was "weak" or "insufficient", the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	○
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	◉
- as sole participant in the proposal is exempt from the financial capacity check.	○

5) The coordinator hereby declares that each applicant has confirmed:

- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	☒
- they have the financial and operational capacity to carry out the proposed action.	☒

The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection

The assessment of your grant application will involve the collection and processing of personal data (such as your name, address and CV), which will be performed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the purposes and means of the processing of your personal data as well as information on how to exercise your rights are available in the privacy statement. Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Detection and Exclusion system of the European Commission (EDES), the new system established by the Commission to reinforce the protection of the Union's financial interests and to ensure sound financial management, in accordance with the provisions of articles 105a and 108 of the revised EU Financial Regulation (FR) (Regulation (EU, EURATOM) 2015/1929 of the European Parliament and of the Council of 28 October 2015 amending Regulation (EU, EURATOM) No 966/2012) and articles 143 - 144 of the corresponding Rules of Application (RAP) (COMMISSION DELEGATED REGULATION (EU) 2015/2462 of 30 October 2015 amending Delegated Regulation (EU) No 1268/2012) for more information see the Privacy statement for the EDES Database.

2 - Participants & contacts

#	Participant Legal Name	Country	Action
1	NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA	EL	
2	IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE	UK	
3	KUNGLIGA TEKNISKA HOEGSKOLAN	SE	
4	UNIVERSITY OF PIRAEUS RESEARCH CENTER	EL	
5	BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION	ES	
6	TECHNICAL UNIVERSITY OF MOMBASA	KE	
7	EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH	CH	
8	ASOCIACION BC3 BASQUE CENTRE FOR CLIMATE CHANGE - KLIMA ALDAKETA IKERGAI	ES	
9	STICHTING JOINT IMPLEMENTATION NETWORK	NL	
10	INNOVATIONS FOR SUSTAINABILITY TRANSITIONS LAB LTD	CA	
11	MISSIONS PUBLIQUES	FR	
12	HOLISTIC IKE	EL	
13	450	FR	
14	EUROPEAN DYNAMICS LUXEMBOURG SA	LU	
15	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	DE	
16	TEP ENERGY GMBH	CH	

2 - Administrative data of participating organisations

PIC	***Legal name***
999978142	*NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA*

Short name: NTUA

Address of the organisation

Street HEROON POLYTECHNIOU 9 ZOGRAPHOU C

Town ATHINA

Postcode 15780

Country Greece

Webpage www.ntua.gr

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....yes

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....08/01/2009 - no

SME self-assessment ..... unknown

SME validation sme.....08/01/2009 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: School of Electrical and Computer Engineering (EPU-NTUA) ☐ not applicable

☒ Same as proposing organisation's address

Street: HEROON POLYTECHNIOU 9 ZOGRAPHOU CAMPUS

Town: ATHINA

Postcode: 15780

Country: Greece

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Haris** Last name: **DOUKAS**

E-Mail: **h_doukas@epu.ntua.gr**

Position in org.: Associate Professor

Department: School of Electrical and Computer Engineering (EPU-NTUA) ☐ Same as organisation name

☒ Same as proposing organisation's address

Street: HEROON POLYTECHNIOU 9 ZOGRAPHOU CAMPUS

Town: ATHINA Post code: 15780

Country: Greece

Website: https://www.epu.ntua.gr

Phone: +302107724729 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Alexandros	Nikas	anikas@epu.ntua.gr	+302107723612

PIC	***Legal name***
999993468	*IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE*

Short name: Imperial

Address of the organisation

Street SOUTH KENSINGTON CAMPUS EXHIBITION

Town LONDON

Postcode SW7 2AZ

Country United Kingdom

Webpage www.imperial.ac.uk

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....yes

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....08/07/1907 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Grantham Institute ☐ not applicable

☒ Same as proposing organisation's address

Street: SOUTH KENSINGTON CAMPUS EXHIBITION ROAD

Town: LONDON

Postcode: SW7 2AZ

Country: United Kingdom

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Ajay**

Last name: **Gambhir**

E-Mail: **a.gambhir@imperial.ac.uk**

Position in org.: Advanced Research Fellow

Department: Grantham Institute, Chemical Engineering

☐ Same as organisation name

☒ Same as proposing organisation's address

Street: SOUTH KENSINGTON CAMPUS EXHIBITION ROAD

Town: LONDON

Post code: SW7 2AZ

Country: United Kingdom

Website: www.imperial.ac.uk

Phone: +44 207 594 6363

Phone 2: +xxx xxxxxxxxx

Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Laila	Read	l.read@imperial.ac.uk	*+44 207 594 8628*
Brooke	Alasya	b.alasya@imperial.ac.uk	*+44 207 594 1181*
David	Law	david.law@imperial.ac.uk	*+44 207 594 6408*

PIC	***Legal name***
999990946	*KUNGLIGA TEKNISKA HOEGSKOLAN*

Short name: KTH

Address of the organisation

Street BRINELLVAGEN 8

Town STOCKHOLM

Postcode 100 44

Country Sweden

Webpage www.kth.se

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....yes

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....23/09/2008 - no

SME self-assessment ..... unknown

SME validation sme.....31/12/2011 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Division of History of Science, Technology and Environment, ABE ☐ not applicable

☒ Same as proposing organisation's address

Street: BRINELLVAGEN 8

Town: STOCKHOLM

Postcode: 100 44

Country: Sweden

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Ethemcan**

Last name: **Turhan**

E-Mail: **ethemcan@kth.se**

Position in org.: Researcher

Department: Division of History of Science, Technology and Environment ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Teknikringen 74D

Town: Stockholm

Post code: 10044

Country: Sweden

Website: https://www.kth.se/en/abe/inst/philhist/historia

Phone: +46737897604

Phone 2: *+xxx xxxxxxxxx*

Fax: *+xxx xxxxxxxxx*

PIC	***Legal name***
999586941	*UNIVERSITY OF PIRAEUS RESEARCH CENTER*

Short name: UPRC

Address of the organisation

Street GR. LAMPRAKI 122

Town PIRAEUS

Postcode 185 32

Country Greece

Webpage

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....yes

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....17/04/2016 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Industrial Management & Technology, TEESLab ☐ not applicable

☒ Same as proposing organisation's address

Street: GR. LAMPRAKI 122

Town: PIRAEUS

Postcode: 185 32

Country: Greece

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Prof. Sex: (•) Male ( ) Female

First name: **Alexandros** Last name: **Flamos**

E-Mail: **aflamos@unipi.gr**

Position in org.: Associate Professor

Department: Industrial Management & Technology, TEESLab ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Karaoli & Dimitriou 80

Town: Piraeus Post code: 18534

Country: Greece

Website: https://teeslab.unipi.gr/

Phone: +302104142460 Phone 2: +xxx xxxxxxxxx Fax: +xxx xxxxxxxxx

PIC	***Legal name***
999655520	*BARCELONA SUPERCOMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACION*

Short name: BSC

Address of the organisation

Street Calle Jordi Girona 31

Town BARCELONA

Postcode 08034

Country Spain

Webpage www.bsc.es

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....01/03/2005 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Earth Sciences ☐ not applicable

☐ Same as proposing organisation's address

Street: Calle Jordi Girona 29

Town: Barcelona

Postcode: 08034

Country: Spain

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: (•) Male ( ) Female

First name: **Raffaele** | Last name: **Bernardello**

E-Mail: **raffaele.bernardello@bsc.es**

Position in org.: Senior Researcher

Department: Earth Sciences ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Calle Jordi Girona 29

Town: Barcelona | Post code: 08034

Country: Spain

Website: https://www.bsc.es/

Phone: +34934137678 | Phone 2: *+xxx xxxxxxxxx* | Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Mar	Rodriguez	mar.rodriguez@bsc.es	*+34 934137566*
Dorota	Jouet	dorota.jouet@bsc.es	*+34 934134082*

PIC	***Legal name***
922182008	*TECHNICAL UNIVERSITY OF MOMBASA*

Short name: TUM

Address of the organisation

Street TOM MBOYA AVENUE

Town MOMBASA

Postcode 80100

Country Kenya

Webpage www.tum.ac.ke

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....unknown

Non-profit .....unknown

International organisation .....unknown

International organisation of European interest .....unknown

Secondary or Higher education establishment .....unknown

Research organisation .....unknown

Legal person .....yes

Industry (private for profit).....unknown

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Partnership, Research and Innovation Department ☐ not applicable

☒ Same as proposing organisation's address

Street: TOM MBOYA AVENUE

Town: MOMBASA

Postcode: 80100

Country: Kenya

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Michael**

Last name: **Saulo**

E-Mail: **michaelsaulo@tum.ac.ke**

Position in org.: Registrar, Partnership, Research and Innovation

Department: Partnership, Research and Innovation Department

☐ Same as organisation name

☒ Same as proposing organisation's address

Street: TOM MBOYA AVENUE

Town: MOMBASA

Post code: 80100

Country: Kenya

Website: http//www.tum.ac.ke

Phone: +254 723843452

Phone 2: +254 724955377

Fax: +254 412495632

PIC	***Legal name***
999979015	*EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH*

Short name: ETHz

Address of the organisation

Street Raemistrasse 101

Town ZUERICH

Postcode 8092

Country Switzerland

Webpage www.ethz.ch

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....yes

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....yes

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....06/01/2009 - no

SME self-assessment ..... unknown

SME validation sme.....06/01/2009 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Transdisciplinarity Lab (TdLab) ☐ not applicable

☐ Same as proposing organisation's address

Street: Building CHN, Universitätstrasse 22

Town: Zürich

Postcode: CH-8092

Country: Switzerland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: ○ Male ◉ Female

First name: **Jenny** | Last name: **Lieu**

E-Mail: **jenny.lieu@usys.ethz.ch**

Position in org.: Senior Scientist

Department: Department of Environmental Systems Science ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Building CHN, Universitätstrasse 22

Town: Zürich | Post code: CH-8092

Country: Switzerland

Website: https://usys.ethz.ch/en

Phone: +41446324907 | Phone 2: +xxx xxxxxxxxx | Fax: +xxx xxxxxxxxx

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Agatha	Keller	grants@sl.ethz.ch	+xxx xxxxxxxxx
Bianca	Vienni Baptista	bianca.vienni@usys.ethz.ch	+xxx xxxxxxxxx

PIC	***Legal name***
998253579	*ASOCIACION BC3 BASQUE CENTRE FOR CLIMATE CHANGE - KLIMA ALDAKETA IKERGAI*

Short name: BC3

Address of the organisation

Street EDIFICIO 1 PLANTA 1 PARQUE CIENTIFICO D

Town LEIOA

Postcode 48940

Country Spain

Webpage WWW.BC3RESEARCH.ORG

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....07/10/2008 - no

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: (•) Male ( ) Female

First name: **Mikel** Last name: **Gonzalez Eguino**

E-Mail: **mikel.gonzalez@bc3research.org**

Position in org.: Research Professor

Department: ASOCIACION BC3 BASQUE CENTRE FOR CLIMATE CHANGE - KLIMA AL ☒ Same as organisation name

☐ Same as proposing organisation's address

Street: SEDE BUILDING 1, 1st floor – Scientific Campus of the University

Town: LEIOA Post code: 48940

Country: Spain

Website: https://www.bc3research.org

Phone: +34944014690 Phone 2: *+xxx xxxxxxxxx* Fax: *+xxx xxxxxxxxx*

Other contact persons

First Name	***Last Name***	***E-mail***	***Phone***
Nerea	Ortiz	nerea.ortiz@bc3research.org	*+34944014690*
Raquel	Vega	projectsoffice@bc3research.org	*+34944014690*

PIC	***Legal name***
994451858	*STICHTING JOINT IMPLEMENTATION NETWORK*

Short name: JIN

Address of the organisation

Street MEERKOETLAAN 27

Town PATERSWOLDE

Postcode 9765 TC

Country Netherlands

Webpage http://www.jiqweb.org

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....03/11/1994 - yes

SME self-assessment ..... unknown

SME validation sme.....03/11/1994 - yes

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: JIN Climate and Sustainability ☐ not applicable

☐ Same as proposing organisation's address

Street: Ubbo Emmiussingel 19

Town: Groningen

Postcode: 9711 BB

Country: Netherlands

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Wytze**

Last name: **Van der Gaast**

E-Mail: **wytze@jin.ngo**

Position in org.: Researcher

Department: JIN Climate and Sustainability ☐ Same as organisation name

☐ Same as proposing organisation's address

Street: Ubbo Emmiussingel 19

Town: Groningen

Post code: 9711 BB

Country: Netherlands

Website: www.jin.ngo

Phone: +31507620930

Phone 2: *+xxx xxxxxxxxx*

Fax: *+xxx xxxxxxxxx*

PIC	***Legal name***
898703643	*INNOVATIONS FOR SUSTAINABILITY TRANSITIONS LAB LTD*

Short name: Innolab Space

Address of the organisation

Street 246 SCHILLER PLACE N.W.

Town CALGARY

Postcode T3L1W8

Country Canada

Webpage https://www.innolab.space/

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status..... unknown

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Innolab ☐ not applicable

☒ Same as proposing organisation's address

Street: 246 SCHILLER PLACE N.W.

Town: CALGARY

Postcode: T3L1W8

Country: Canada

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Luis**

Last name: **Virla**

E-Mail: **ldvirlaa@ucalgary.ca**

Position in org.: Co-Director

Department: Innolab ☐ Same as organisation name

☒ Same as proposing organisation's address

Street: 246 SCHILLER PLACE N.W.

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PIC	***Legal name***
998211190	*MISSIONS PUBLIQUES*

Short name: MISSIONS PUBLIQUES

Address of the organisation

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Town Paris

Postcode 75002

Country France

Webpage www.missionspubliques.com

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....unknown

International organisation of European interest .....unknown

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....12/12/2008 - yes

SME self-assessment ..... unknown

SME validation sme.....12/12/2008 - yes

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Antoine**

Last name: **Vergne**

E-Mail: **antoine.vergne@missionspubliques.com**

Position in org.: Director of strategic partnerships

Department: MISSIONS PUBLIQUES ☒ Same as organisation name

☒ Same as proposing organisation's address

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PIC	***Legal name***
933332255	*HOLISTIC IKE*

Short name: HOLISTIC IKE

Address of the organisation

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Town AGIA PARASKEVI

Postcode 153 43

Country Greece

Webpage www.holisticsa.gr

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....07/01/2015 - yes

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr.

Sex: (•) Male ( ) Female

First name: **Evangelos**

Last name: **Marinakis**

E-Mail: **vmarinakis@holisticsa.gr**

Position in org.: Managing Director

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☒ Same as proposing organisation's address

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Country: Greece

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PIC	***Legal name***
931753580	*450*

Short name: 450

Address of the organisation

Street 11 RUE DE POULIZAN

Town PLOUGONVELIN

Postcode 29217

Country France

Webpage www.compteepargneCO2.com

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....31/12/2018 - yes

SME self-assessment .....31/12/2018 - yes

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

No department involved

Department name: *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street: *Please enter street name and number.*

Town: *Please enter the name of the town.*

Postcode: *Area code.*

Country: *Please select a country*

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mr.

Sex: (•) Male ( ) Female

First name: **Jean-Luc**

Last name: **Baradat**

E-Mail: **jean-luc.baradat@wanadoo.fr**

Position in org.: CEO

Department: 450

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☒ Same as proposing organisation's address

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PIC	***Legal name***
947337891	*EUROPEAN DYNAMICS LUXEMBOURG SA*

Short name: ED LUXEMBOURG

Address of the organisation

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Town LUXEMBOURG

Postcode 1466

Country Luxembourg

Webpage www.eurodyn.com

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....01/07/1998 - yes

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: R&D ☐ not applicable

☒ Same as proposing organisation's address

Street: RUE JEAN ENGLING 12

Town: LUXEMBOURG

Postcode: 1466

Country: Luxembourg

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Mrs

Sex: ○ Male ◉ Female

First name: **Anastasia**

Last name: **Garbi**

E-Mail: **anastasia.garbi@eurodyn.com**

Position in org.: Head of R&D

Department: R&D

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PIC	***Legal name***
999984059	*FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.*

Short name: Fraunhofer

Address of the organisation

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Town MUNCHEN

Postcode 80686

Country Germany

Webpage www.fraunhofer.de

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....yes

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....yes

Legal person .....yes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....15/09/2008 - no

SME self-assessment ..... unknown

SME validation sme.....15/09/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: Fraunhofer ISI ☐ not applicable

☐ Same as proposing organisation's address

Street: Breslauer Straße 48

Town: Karlsruhe

Postcode: 76139

Country: Germany

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. Sex: ○ Male ◉ Female

First name: **Andrea** Last name: **Herbst**

E-Mail: **andrea.herbst@isi.fraunhofer.de**

Position in org.: Senior Scientist

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Mahalia	Brózda	mahalia.brozda@zv.fraunhofer.de	*+xxx xxxxxxxxx*

PIC	***Legal name***
972178233	*TEP ENERGY GMBH*

Short name: TEP Energy

Address of the organisation

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Town ZURICH

Postcode 8037

Country Switzerland

Webpage www.tep-energy.ch

Legal Status of your organisation

Research and Innovation legal statuses

Public body .....no

Non-profit .....no

International organisation .....no

International organisation of European interest .....no

Secondary or Higher education establishment .....no

Research organisation .....no

Legal person .....yes

Industry (private for profit).....yes

Enterprise Data

SME self-declared status.....16/07/2008 - yes

SME self-assessment ..... unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Department(s) carrying out the proposed work

Department 1

Department name: TEP Energy GmbH ☐ not applicable

☒ Same as proposing organisation's address

Street: ROTBUCHSTRASSE 68

Town: ZURICH

Postcode: 8037

Country: Switzerland

Dependencies with other proposal participants

Character of dependence	***Participant***	

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title: Dr. | Sex: (•) Male ( ) Female

First name: **Ulrich** | Last name: **Reiter**

E-Mail: **ulrich.reiter@tep-energy.ch**

Position in org.: Senior project manager

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☒ Same as proposing organisation's address

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Country: Switzerland

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Phone: +41435007173 | Phone 2: +41798765969 | Fax: *+xxx xxxxxxxxx*

3 - Budget

Total requested EU contribution for the proposal/ €	4 914 000

DESIRE

A citizen-oriented integrative assessment of climate action, aiming to explore, co-create and foster engagement, lifestyle changes and convergences

1. Excellence

1.1 Objectives

2020 is the first of a series of milestones along the way to tackle climate change and deliver on the Paris Agreement, with Parties to the UNFCCC expected to submit updated NDCs towards 2030 as well as mid-century GHG emission development strategies, followed by the 2023 Global Stocktake of progress and gaps. Being both among top emitters and one supranational body with a collective action pledge, the EU is a key and unique participant to these processes, facing the additional challenge of achieving and monitoring progress at the Community and Member State level.

Regardless of scale, effective climate action requires that a jigsaw of regulatory initiatives be put together, altogether comprising effective, socially acceptable and robust climate policy in a globally coordinated, cooperative and timely manner[1]. Similarly, science in support of climate policymaking—heavily dominated and underpinned by energy, sectoral and integrated assessment models (IAMs)—attempts to assess interactions within the spectrum of highly intertwined pillars including technology, economy, environment, policy and society[2]. Whatever the theory, structure, coverage and focus of these tools[3], and despite most well-below-2°C-compatible mitigation scenarios describing transformations in both energy supply and (increasing) energy demand, modelling practice however tends to focus predominantly on the supply side opportunities, costs, feasibility, structural changes, challenges and action space[4].

The demand side is therefore largely underrepresented, via technological options in energy efficiency improvements, while values, choices, cohesion, culture, behavioural changes and all that is lifestyle and society are only narrated as assumptions[5] not interacting with, and marginalised from, the vividly modelled technology-economy-environment-policy flows. Even modelling scenarios looking at end-use transformations, like digitalisation of daily life and pervasive integration of new information technologies into energy services[6], mostly explore the maximum potential of technological breakthroughs. They overlook that, without the necessary behavioural and societal transformations, the world is very possibly looking at a generalised, society-wide rebound effect resembling known paradoxes[7,8]: for instance, with consumers enjoying access to a multiplicity of energy-efficient yet easier and openly accessible services, living potentially outside environmental limits, energy use may instead grow[9]. In fact, limited attention is being paid to this side of transition, such as the multiple dimensions of structural changes[10]; the role and readiness of individuals and households[11]; the importance of social innovation and systemic forms of social change[12]; public engagement, adaptation and acceptance; challenges of energy sufficiency[13]; social justice[14] and gender aspects[15].

Growing cautious of uncertainties[16], window of opportunity[17] and limitations[18] of supply-side transformations relying on negative emissions technologies (NETs), modellers have been seeking solutions elsewhere[19], stressing the need to improve modelling of end-use and lifestyle changes[20]. With progress happening on all fronts of transitions studies[21] and acknowledging the potential of complementarities[22] in capturing the broad capacity and implications of climate action and improving the quality of knowledge interactions[23], researchers from the modelling community on one side and social sciences and humanities on the other have been reaching out to one another, calling for convergence[24].

This is the crossroads DESIRE is situated on, motivated to respond to this call and address the outlined challenges, acknowledging that scientific support to climate action is not only about exploring capacity of what—in terms of policy and outcome—but also about assessing feasibility and desirability—in terms of when, where and especially for whom. Recognising the importance of citizen engagement, the role of societal acceptance and uptake of end-use technologies, and decarbonisation potential lying in shifting lifestyle patterns in climate change and action, DESIRE will delve into the role of individuals, households, communities and institutions in the required societal, technological and energy transitions necessary for the envisaged pathways, at national, EU and global level. With a ***diverse modelling, operations research and citizen engagement toolset*** and an ***interdisciplinary consortium of sociologists, human geographers, environmental historians, anthropologists, psychologists, economists, physicists, engineers, climate scientists in Europe and around the globe***, DESIRE will set out to deliver on the following ***Objectives (O)***:

- **O_1. Household, community, firm level: *to assess how social innovation influences households and communities in the required national socio-technical transitions***, including critical aspects of behavioural change; ***explore how household- and community-level changes can be incentivised***; and ***identify barriers to public engagement/acceptance*** and means to overcome them. In order to meaningfully design and carry out socio-technically informed modelling exercises, it will employ systems of innovation frameworks applied at broader lifestyle changes; and reinforce its integrated assessment modelling activities by reflecting the decision-making process of firms and consumers in the energy system, using agent-based models (MUSE, ALADIN & ATOM).
- **O_2. Citizen level: *to explore innovative ways of engaging citizens; assess and encourage motivation***; and ***understand cognitive, financial, technical, regulatory and other socio-economic barriers*** to action against

climate change, within and across different communities. To this end, a situated micro-perspective on local-scale, intentional projects (e.g. ecovillages, transition towns and their practices in sharing economy, such as urban gardening, electro-mobility, slow food - slow city, and car-free living, in Europe and around the globe) and unengaged communities will be captured. To investigate this, we will draw from serious and role-playing games, companion modelling, principles of co-creation and deliberative democracy, fuzzy cognitive maps and multi-criteria group decision making with consensus analysis. In doing so, we will focus on understanding motives, concerns, strategies and expectations of engaged citizens, to learn how to replicate and up-scale good practices; and of citizens removed from the low-carbon agenda, to inform, educate and engage in such practices.

O_3. National, European, global level: *to develop a robust and fully-integrated assessment modelling framework* for exploring national, EU and global mitigation pathways; ***economic and climate impacts of shifting lifestyle and consumption patterns***; ***health and other co-benefits*** of climate action across the sustainability spectrum; ***and possible consequential risks***, like energy poverty, injustice and rebound effects**.** This builds on insights from O_1 and O_2 and a powerful modelling armoury comprising state-of-the-art IAMs (GCAM, TIAM, MUSE), energy demand models (FORECAST, DREEM), robustness analysis methods, and harmonised scenario design.

Oriented on citizens—whose support and buy-in are critical for the pace and scale of the requisite transition to happen—social innovation research; integrated assessment, sectoral and agent-based modelling; citizen engagement and knowledge elicitation; and gamification activities are mobilised to accomplish the three overarching objectives.

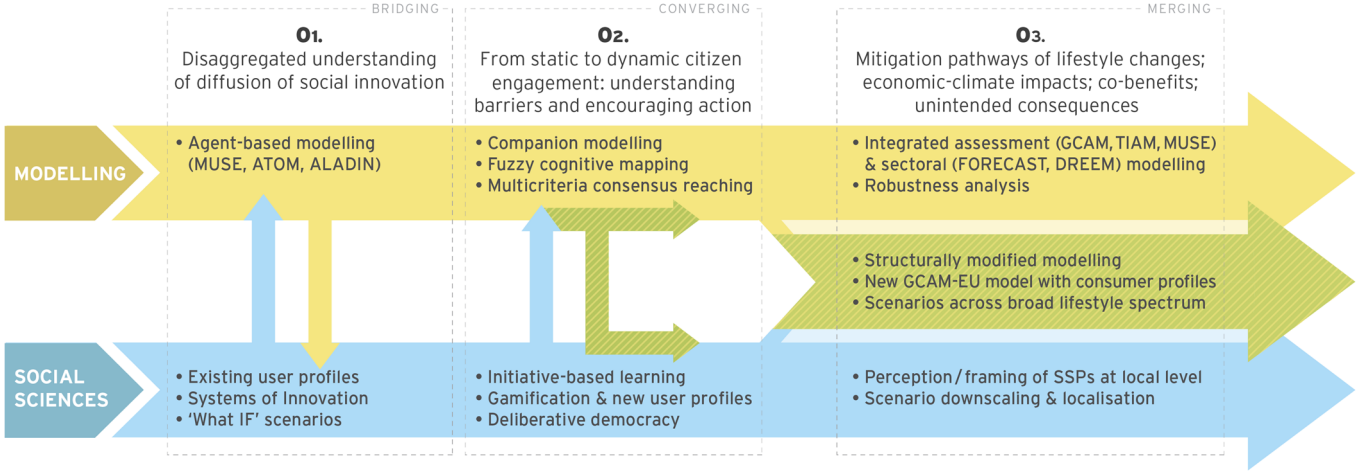


Figure 1: The overall concept, objectives and tools of DESIRE, adapted[2]

1.2 Relation to the work programme

DESIRE addresses **sub-topic (b)** of topic "**LC-CLA-10-2020**: Scientific support to designing mitigation pathways and policies", i.e. "Decarbonisation and lifestyle changes". The following table indicates how the main **objectives (O)** and respective activities are aligned with the scope and challenges of the topic.

Scope	O	Envisaged activities addressing the challenges and scope of the work programme
" Analysing the role of **individuals** (including gender aspects), **households** and **communities** in the socio-technical transition, critical areas of lifestyle change, and associated **social innovation** processes necessary"	**O_1, O_2**	Drawing from its inter-disciplinary consortium, DESIRE will first and foremost contribute to ***linking individual choices and creating different user profiles to comprehend societal innovation and its diffusion at different levels and scales***, which remains an understudied area associated with the domain of cognitive psychology. This revolves around scaling up low-carbon innovation and developing characteristics of different user profiles based on different backgrounds, providing a disaggregated understanding of the diffusion of social innovation. It will thus facilitate modelling this diffusion based on technological innovation and agent-based models, in an attempt to link individual behaviours to group behaviour preference. We will furthermore explore ***aspects of energy sufficiency*** as drivers of behavioural change that cuts across electricity and heat, the built environment, the transportation sector and food systems; ***energy and climate justice*** issues across income groups, labour, race, gender and age; and unintended consequences, like rebound effects or downscaling impacting industries and jobs. Towards complementing the efforts of meaningfully informing modelling analyses, DESIRE will capture real-life contexts and explore social innovations, using Systems of Innovation frameworks on ***broader-than-technological lifestyle changes***. It will also expand their scope to capture ***a full overview of the national priorities across several sustainability dimensions***, their ***synergies and conflicts*** in respect to the necessary transitions, the ***enabling environment***, the ***relevant innovation system functions***, and ***the levels in which transitions must take place***.

Scope	O	Envisaged activities addressing the challenges and scope of the work programme
" Considering, inter alia, the **economic and climate impact** of shifting lifestyle and consumption patterns, and the **health co-benefits** of action, as well as the risks of unintended consequences (e.g. rebound effects)"	**O_3**	DESIRE will ***design and simulate model scenarios that heavily orient on various levels of lifestyle changes, across a diverse set of dimensions***[25], such as dietary changes and food waste; consumption profiles in residences, commercial and industrial buildings; shifts in transport; circular economy. The modelling component of DESIRE will ***analyse the economic impacts of shifting lifestyle and energy use patterns*** across the entire globe, broken down into regions, based on IAMs explicitly featuring ***climate feedbacks*** (**TIAM**, **GCAM**), a climate model (**EC-Earth3**) and the **MUSE** agent-based energy modelling framework. Special attention will be given to the EU and its detailed representation, by supplementing global modelling results with demand-side sectoral modelling (**FORECAST**); and developing a new EU version of GCAM, with Member State-level granularity for demand from different types of consumers. Despite the core modelling component of DESIRE mainly focusing on trade-offs between behavioural changes and NETs, existing knowledge gaps—relating to costs of implementing behavioural changes, in terms of welfare, and to costs of supporting infrastructures—will be explored. We will furthermore explore impacts *in conjunction with different timings and levels of technological availability and deployment*, considering ***health co-benefits*** *(across a wide range of indicators*[26]) and ***implications for different sustainability dimensions*** *of the 2030 Agenda for Sustainable Development*: food availability and prices; groundwater depletion and sanitation; cost-effectiveness and availability of low-carbon energy, biomass use and penetration of renewable energy; jobs, system costs, growth and mitigation-related economic losses; energy infrastructure and investments; footprint impact; land use and land use change. Finally, contrary to (or expanding) emerging research questions, DESIRE modelling scenarios will neither anchor to maximising the potential of NETs, nor assume complete lifestyle change-driven decarbonisation scenarios, but will rather ***explore different shades of behavioural changes***. Scenario design will follow the policy agenda and orient on existing and emerging knowledge gaps, considering socioeconomic conditions, including but not limited to: - *societal value changes (e.g. across the usership-ownership spectrum, diet change elasticity)* - *alternative or emerging business models and sociotechnical trends (e.g. sharing economy)* - *novel legal frameworks, voluntary inter-industry agreements* - *technical and social innovation rate and digital service integration* However, different implications of pervasive technological change will be considered, including negative effects. These could encompass overall ***rebound effects linked with the emergence of new energy-expensive services*** and ***improved efficiency in digitalisation and future convergence of currently individual services***, considering recent past trends (like data transfer, search engine innovations, streaming, crypto-currency and computing demands). It will also encompass a broader ***consideration of emerging social trends***, such as increased substitution of *artificial intelligence and robotics for labour*; as well as mega-trends emerging from movements for climate action, like *flight-shaming* (flygskam) and *train brag* (tågskryt). These considerations will affect the employed modelling approaches and scenario building, so that ***digital capacity and accumulation of human and social capital*** be considered, and ***pervasive uncertainties*** be represented in the scenarios, building upon and augmenting the standardised energy demand and intensity assumptions and flexibility of the SSP[5] framework.
" Exploring how citizen and household level changes can be incentivised and analysing enablers for and barriers to **public engagement and acceptance**"	**O_1**, **O_2**	Expanding the scope of energy modelling, DESIRE will attempt to ***understand a plethora of characteristics of the consumers' behaviour affecting investment decisions***, by modelling different citizens' and households' decision-making processes in the energy system. It will integrate the wide range of decision-making steps, from information gathering, to performance assessment, and to alternative option selection, towards capturing a realistic representation of the energy system, in markets in transition[27]. Based on real-life agent behaviour simulations, it will also ***explore game-changing business models and innovative regulatory frameworks*** to: - *maximise the value of technological capability* (**DREEM**) - *incentivise and diffuse changes at households of different profiles* (**ATOM**) - *encourage alternative fuel vehicle purchasing and investment decisions* (**ALADIN**) Furthermore, drawing from the United Nations' commitment to ensure that "no one is left behind", by "reaching the furthest behind first", we will pay particular attention to "left behind" and disadvantaged communities and individuals, to understand how their aspirations and perceptions can be mapped onto the requirements and opportunities of a low-carbon transition.

Scope	O	Envisaged activities addressing the challenges and scope of the work programme
" Exploring possible policies and communication strategies on climate action where appropriate in conjunction with health co-benefits"	**O_2**	The best way to explore complex policies related to a global and highly complex issue is to deploy governance tools that are fit for the task. ***Tools of Governance*** inherited from the 19th and 20th century like representative democracy, opinion polls or expertise are very valuable but need a deliberative, participatory addition to cope with the non-linear, connected, globalised world. ***Deliberative processes*** based on models like ***Citizens' Assemblies or Global Citizens' Dialogues*** are a way to bridge the gap; and have successfully been tested and deployed in many cases and contexts (e.g. World-Wide Views on Climate, Citizens' Dialogue on the Future of Internet, French/UK Citizens' Assemblies on Climate). Discursive activities will be reinforced by ***integrating modelling or non-modelling tools with role playing games***, to capture insights of different collaborators and allow them to interact with behavioural elements, revealing stakeholder-induced effects and associated impacts. In these, we will inter alia emphasise impacts of climate change and lifestyles on health, equalities, employment and sustainability.
" Investigating existing low-carbon lifestyles within **intentional communities** like **eco villages, transition towns, slow food, slow city** movements **or car-free** living"	**O_2**	Towards gaining insights into, duplicating and upscaling local-level success stories, DESIRE will help understand the concerns, motives and preferences of both policymakers and citizens coming from intentional communities, in which climate-friendly lifestyles and energy profiles are already a reality. DESIRE will design topic-tailored discussion *fora* in such communities and—based on engagement facilitation and knowledge elicitation tools, as well as employing deliberative democracy principles—capture the ambition driving the motivation; concerns and factors hampering action; and lessons to be learnt and used for other communities. These will include ***eco-villages in Greece*** (Evolving Cycles, Athens; Free and Real, Euboea; Korogonas Ark, Lakonia; Re-green, Ahaia); ***slow food - slow city movements in Switzerland and Spain*** (e.g. Balmaseda, Mungia, Lekeitio in Bilbao); ***urban commons movements in Sweden*** (e.g. Sharing Cities programme) ***and Italy*** (CleaNap and Friarielli Ribelli initiatives as grassroots innovations); ***transition towns in Kenya*** (e.g. Kakamega) ***and Canada*** (e.g. Kamloops and Red Deer, Calgary); and ***European car-free zones or car-free-seeking cities*** in Belgium and Zurich. We will capture a diversity of concerns, motivation and expectations, by also ***engaging non-traditional communities***, like youth movements for climate (Sunrise Movement, Fridays for Future, Zero Hour, etc.) to comprehend how different societal sections perceive low-carbon futures; and carry out a comparative case study of ***social learning for decarbonisation through #StayGrounded-#FlyingLess*** movements with a focus on ***Spain, Italy, Germany and Sweden***.
" Exploring **citizen science** activities as a way to engage and educate citizens on climate action"	**O_2, O_3**	***Deliberative Democracy*** promotes co-creation of the future and unlocks capacity for long-term action. It can show the road to relevant/accepted policies and communication activities towards the general public: engaged citizens of truly diverse profiles in such fora (a) are free of agenda and vested interests, therefore representative of the diversity of their country/region, and hence ***reflect the blockades and drivers for change***; (b) go through a condensed process of ***education*** (interaction with experts/stakeholders) and ***deliberation*** (the highly cognitively diverse group goes through a process of collective intelligence); and (c) output a set of recommendations that can find ***collective acceptance*** because of this inclusive, fact-based, deliberative process. Often recommendations are found to be a solid predictor for public opinion 4-6 years in the future. Through ***gamification***, we will invite citizens from different communities to ***interact with one another***; ***get informed*** on latest scientific findings; ***explore lifestyle options*** leading to different climate results; and ***experience*** the role of one another, ***increasing mutual understanding***.

1.3 Concept and methodology

(a) Concept

Acknowledging the importance of citizen engagement and the role of societal acceptance and uptake of end-use technologies as well as the decarbonisation potential lying in shifting behavioural and lifestyle patterns in climate change and action, DESIRE will delve into the role of individuals, households, communities and institutions in the required societal, technological and energy transitions necessary for the envisaged decarbonisation pathways.

First, DESIRE will aim to gain a better understanding of the core components of social innovation at the **citizen level**, through ***initiative-based learning***, citizen sciences and ***gamification***, expertise-driven qualitative techniques like fuzzy cognitive maps and convergence-seeking multicriteria analysis, as well as ***social innovation analysis***. It will explore social innovation at the **household, community, sectoral level** by identifying enablers of, barriers to and consequences of various dimensions of transition from the perspective of citizens from different communities; and employ in-depth case studies to better appreciate the local context and explore lessons learnt in, up-scale potential

of and factors hampering existing sustainable lifestyles within intentional communities around the world. Upon engaging with people from different mainstream (in transition studies), non-traditional (intentional) and unengaged (removed from the low-carbon agenda) communities to understand their concerns over, motives for, preferences in and perceptions of low-carbon futures, we will capture and go beyond framings of the Shared Socioeconomic Pathways (SSPs) at the local level and survey how these are understood, downscaled and perceived in local contexts.

Bridging the local-level perspective with a ***novel quantitative systems modelling*** component, DESIRE will explore lifestyle change-driven scenarios, which are complementary or alternative to the NETs-oriented ones dominating the literature, featuring different levels of carbon dioxide removal technological availability and diffusion; coupled with different levels of behavioural change, social innovation and access to emerging services. Based on a core ensemble of integrated assessment, bottom-up models (**GCAM**, **TIAM**, **MUSE**), DESIRE will not only evaluate strategies based on soft measures, incentives, and technological scenarios. It will also explore the diverse socioeconomic impacts and costs of structural changes, such as those implied in a world of varying shifts between ownership and sharing; as well as in an era of digitalisation and the broad spectrum of its potential implications for energy demand, including replacement of services by smart electronic devices and emergence of new energy-consuming services and the opportunities these may entail. Far from the assumed optimising behaviour of strictly formalised modelling frameworks, DESIRE will also perform analyses at the sectoral level to simulate trends on and capture impacts from shifting energy demand, based on the **FORECAST** model, while putting efforts into making sectoral and integrated assessment modelling analyses comparable. It will also employ agent-based models (**ALADIN**, **ATOM**, **MUSE**'s agent-based module) to simulate purchasing decisions (uptake of alternative fuel vehicles, modal shifts, etc.); and demand-side management models (**DREEM**) to explore reward-driven household innovations (e.g. complementary kWh/carbon currencies), considering direct (costs vs. consumption) and indirect (service demand) rebound effects.

Finally, we will make use of the ***best available science*** embedded in the latest major scientific assessments (e.g. IPCC AR6), exploring how these can be converted into practical advice for global, EU and national climate policy-making. In this direction, we will help design breakthrough policies aimed at building robust narratives around climate change triggering individual behaviour changes. To make its outcomes policy-relevant on all fronts, DESIRE will also explore synergies and trade-offs with overarching sustainability directions of our time, including SDGs, like gender and social equality, poverty and hunger elimination, skill development and employment shifts, and health co-benefits of climate change-related behavioural change. Finally, DESIRE will design its activities so as to provide Paris Agreement-compliant national and global pathways and fruitful insights into how these can inform the next NDC submission round, with key focus on behavioural and societal actions that can complement technological shifts.

DESIRE aims to mobilise "boots on the ground" expert knowledge, maximise ownership of climate policy, and most importantly understand the local social context of different communities of various backgrounds (culture, social innovation, customs, lifestyle, energy consumption patterns, level of engagement, etc.), within and outside Europe. As such, the consortium comprises universities and research institutes, NGOs, companies, and social entrepreneurs, with modelling, decision support and/or citizen engagement expertise, from numerous European as well as two non-European countries. The team of ***fourteen European partners*** include: National Technical University of Athens, Greece (**NTUA**); Associacion BC3 Basque Centre for Climate Change, Spain (**BC3**); Barcelona Supercomputing Center, Spain (**BSC**); Compte CO_2, France (**CCO2**) European Dynamics, Luxembourg (**ED**); Swiss Federal Institute of Technology in Zurich, Switzerland (**ETH**); Fraunhofer Institute for Systems and Innovation Research, Germany (**Fraunhofer ISI**); Holistic, Greece (**Holistic**); Imperial College of Science Technology and Medicine - Grantham Institute, UK (**Imperial**); Joint Implementation Network - Climate and Sustainability, Netherlands (**JIN**); Royal Institute of Technology in Stockholm, Sweden (**KTH**); Missions Publiques, France (**MP**); TEP Energy, Switzerland (**TEP**); and University of Piraeus Research Centre, Greece (**UPRC**). ***Partners outside Europe*** include: Innovations for Sustainability Transitions Lab, Canada (**INNOLab**); and Technical University of Mombasa, Kenya (**TUM**).

Cooperation and coordination are key to climate action, which can only be effective in a globally cooperative manner. The notion of enhanced cooperation is reflected in DESIRE, not only in the envisaged analyses of lifestyle-oriented mitigation pathways for European countries, the EU, non-European countries/regions, and the globe; but also in terms of scientific cooperation. DESIRE will draw from the consortium members' participation in, coordination of, or collaboration with ongoing research and innovation projects, by joining forces in research; broadening outreach to promote inclusiveness and stakeholder participation and representation; and exploiting outputs that will feed into its activities. We will build upon data/work already or currently being produced/carried out by initiatives and research aiming to improve modelling capabilities (***NAVIGATE***, ***LOCOMOTION***, etc.) and link them to lifestyle profiles (e.g. ***TRANSrisk***); crowdsource research questions and concerns drawing from lessons from ***PARIS REINFORCE*** and ***ENGAGE***; establish synergies with projects developing open and transparent modelling platforms for assessing low-carbon pathways in Europe (***SENTINEL***, ***openENTRANCE***, etc.); enable integration of modelling results with ***IAMC***'s protocol and scenario explorer (as used by ***SET-Nav*** and IPPC's SR1.5°C) and emerging open-access platforms (e.g. ***I²AM PARIS***); and learn from games aimed at raising climate awareness, such as the ***Climate Collage***.

(b) Methodology

1.3.b.1 Providing a more disaggregated understanding of the diffusion of social innovation

Drawing from its inter-disciplinary consortium, DESIRE will scale up low-carbon innovation, from individual to society, and develop characteristics of user profiles based on various economic and socio-cultural backgrounds, providing a more disaggregated understanding of the diffusion of social innovation. This will help link individual preferences to group behaviour and model this diffusion based on technology innovation models. In this domain, we will also explore aspects of 'energy sufficiency', 'downscaling' and 'energy descent', as drivers of behaviour change through direct/embodied energy use that cuts across electricity and heat, buildings, transport and food, and as drivers of degrowth with impacts on industry. We will support quantitative evidence of these by "what if" scenarios[28], which will further explore impacts on energy and climate justice issues: shifts in behaviour, energy provision and access to services may lead to unequal distributional outcomes and further social injustices across generations and across income groups, labour, race, and gender[29], with the latter being central in formation, response and responsibility bearing of energy transitions[30]; while resulting material consumption may impact manufacturing—and employment.

Furthermore, towards meaningfully informing modelling exercises for the selected national and local case studies, we will carry out extensive sociotechnical analyses based on Systems of Innovation frameworks, to capture the real-life context and explore societal innovations in terms of lifestyle changes. These will not be limited to technology, but extend their scope to dietary selections[31], energy and other consumption profiles, investment decisions, means of transportation and modal shifts[32], and broader lifestyle changes; and their focus will depend on the domains of interest to each case by accordingly exploring different (or combinations of) frameworks. The analyses will be extended to capture a concrete overview of national priorities across several SDGs, as well as synergies and conflicts of these priorities, in respect to the necessary transitions and their components, actors, levels and functions of innovation. Dissemination of results will be enhanced by mapping innovation systems in the face of climate crisis and in light of the Paris Agreement[33], in interactive infographics aimed at citizens, policymakers and relevant stakeholder groups.

Finally, DESIRE will initiate modelling activities by attempting to understand key characteristics of consumers' behaviour affecting investment decisions, by simulating the decision making processes of heterogeneous decision makers (with different objectives, search strategies, and decision methods) in the energy system[34], using the MUSE model[35,36] and integrating several decision-making steps (information gathering, performance assessment, alternative option selection) towards capturing a realistic representation of energy markets in transition[27]. Acknowledging the need to also explore game-changing business models and novel regulatory frameworks that can monetise/maximise the value of technological capability so as to engage citizens and incentivise changes at the household level, we will explore the benefits of different technological configurations towards energy autonomy with DREEM[37], and the ways in which envisaged innovations can be adopted by and diffused into households of different profiles with ATOM[38], focusing on the local case study context. DESIRE will finally delve into policy instruments and market models targeting alternative fuel vehicle purchasing/investment decisions as well as simulate real-life behaviour and modal shifts[39,40], using ALADIN[41]; while scaling up focus to the EU level, by looking into electrification strategies; simulating infrastructure evolution; and assessing the introduction of synthetic fuels in air and water transport.

1.3.b.2 Initiative-based learning, deliberative democracy, and gamification of behavioural change for climate

The role of grassroots innovation for social transformation towards decarbonisation is often underestimated. Citizen-led transformations link mobilisation, network formation and institution building for sustainability transitions, and interact with state- and market-led transformations in many ways[42]. Political agency is central to such endeavours by challenging assumptions and engaging with alternatives that may be invisible to the mainstream view[43], such as post/degrowth initiatives at the local and regional levels[44]. These transformations also engage in societal innovation by navigating the transformative climate action 'in, against and beyond the state' in the transnational space[45]. These groups, however, along with their societal and cultural power, are not fully taken into consideration in shaping global future scenarios, such as those given in SSPs. We will, therefore, conduct a first-of-its-kind comparative assessment in grounding SSPs with local intentional communities, by filling the gap in debates on SSPs, which is the role of the local scale, where most of the unexpected transformations occur. In this regard, our key research questions will be:

a. how do people in different levels of organisation (in the grassroots organisations, neighbourhood associations and local authority levels) perceive and contribute to the representation of global socioeconomic pathways? What types of scenarios, model outputs and futures are imagined, represented and legitimised?
b. what are the barriers and enabling factors for envisioning alternative future scenarios regarding transformative climate action across different organisational levels?

We will explore this gap by looking at where and why unexpected transformations take place, how transformational leadership plays a role, and how grassroots innovations for decarbonisation could move beyond business-as-usual for transformative change towards alternative futures broadly defined by SSPs. We will therefore co-produce cutting-edge knowledge with societal end-users in combining horizontal (across different social groups, across space) and

vertical (across time) dimensions of societal scenarios towards shared futures; and attempt to address the 'failure of imagination'[46] on climate change, from an interdisciplinary perspective. Imagining new societal futures "including the policies, technologies, behaviours, values and change processes is something that we need to learn and practice"[47].

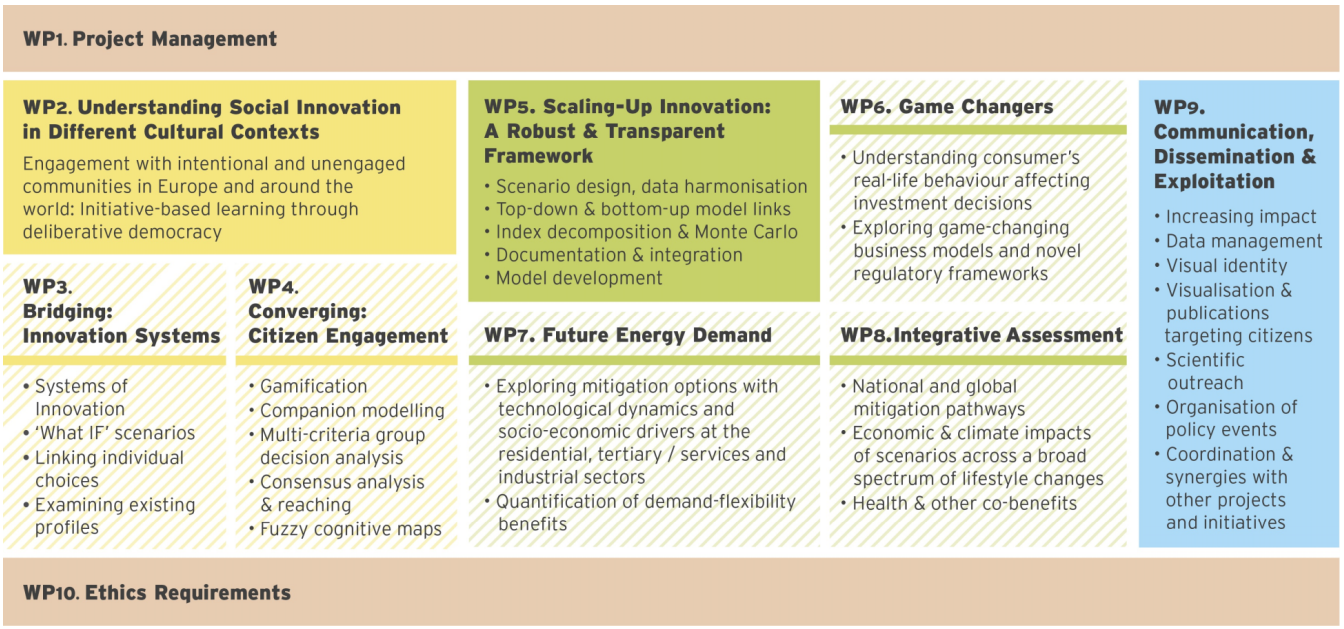


Figure 2: The DESIRE work structure

Towards gaining insights into, duplicating, and upscaling local-level success stories, DESIRE will seek to understand the concerns, motives and preferences of citizens coming from intentional communities, in which climate-friendly lifestyles and energy profiles are already a reality. We will design topic-tailored discussion fora in such communities and, by means of polling platforms, multi-criteria group decision aid[48] and consensus measuring[49] and simulation[50], capture the ambition driving their motivation[51] as well as their concerns and factors hampering further action, as lessons to be learnt and diffused. Drawing from these lessons, a series of deliberative processes will be held in places and unengaged communities, with no representation in the low-carbon agenda or limited understanding, efforts and planning to reduce carbon footprint and improve quality of life, in a citizen-led, deliberative setting[52]. Based on the Citizens' Assemblies and Citizens' Dialogues model and fuzzy cognitive maps, extended to assess strategies and their vulnerability to uncertainties[53], citizens will be engaged to express their perspectives, in order to evaluate policy strategies from their point of view, and inform[54] or improve[55] modelling. We will attempt to understand how their understanding and aspirations can be mapped onto requirements and opportunities of a transition driven by lifestyle changes. We will also focus on communities in fossil fuel-dependent regions, to understand how transition can be just, building on evidence of the importance of dialogue to achieve distributional justice[14] and gender equality[15].

DESIRE will finally contribute to better understanding the diffusion of social innovation at the national and global level, through gamification. Gaming (interaction of actors with a simulated environment according to specific rules) can be useful to transitions research aimed at stakeholder/citizen engagement, raising awareness, and understanding lifestyle changes[56]. Role playing and serious games have long been used for social learning and simulating transitions across various environment, energy and climate issues[57,58,59]. Via companion modelling[60], our models will be coupled with such games, to capture insights of different collaborators and allow them to interact with or give rise to decision-rules and behavioural elements, which can be tested in fuzzy cognitive maps, consensus analysis, citizens' assemblies in real time, and implemented in agent-based models, revealing stakeholder-induced effects. Gamification potential will be explored via interactive platforms aimed at increasing awareness of climate change and individual action. This will help link bottom-up initiatives to top-down assessments of behaviours and policies across energy, transport, food and buildings; and integrate climate (-economy) modelling and emissions scenarios with game outputs, by incorporating elicited information, including players' lifestyle choices, which—when scaled up—will determine emissions reductions from reference scenarios (and climate impacts, e.g. based on relevant CMIP6 climate indices).

1.3.b.3 Robust integrated assessment & sectoral modelling in a transparent, integrative scenario framework

Apart from designing and simulating IAM scenarios heavily orienting on different levels of lifestyle changes across a diverse set of dimensions, DESIRE will also address the need to clarify voluntary behavioural changes, on one side, from changes due to policy implementation, on the other; and delve into behavioural change to the level of understanding the drivers of such changes and modelling how these may develop. The modelling exercise will begin by defining model parameters, assumptions and scenario drivers in terms of efficiency (same output, lower input requirements), technological substitution (same output, different sets of inputs) and lifestyle change (different output/services)[20]; and in terms of efficiency, consistency and sufficiency[61] and other distinctions/ frameworks[62].

The DESIRE modelling component will analyse the entire globe, broken down into regions, based on TIAM and GCAM; a GCAM-EU model will be developed, with demand from different types of consumers (income quintiles, urban-rural, lifestyle profile, etc.) separated per EU Member State, making use of relevant survey data (Household Budget Survey, EU Statistics on Income and Living Conditions, and Household Finance and Consumption Survey). This will help identify various lifestyle profiles among different social groups at the EU member state level, thereby serving to assess the impact of top-down mitigation policy on different groups in society and allowing to explore the impact of potential growth of specific lifestyle profiles on achieving emission cuts in the EU. With energy demand lying at the heart of lifestyle-change driven action, we will consider a broad range of mitigation options to reduce emissions, combined with technology dynamics (at a high level of detail) and socioeconomic drivers, at the residential and tertiary/services sectors, with FORECAST[63]: technology diffusion and stock turnover will explicitly be considered, giving insights into transition pathways; while different energy efficiency and mitigation policies will be integrated, responding to research questions on energy demand. Coupled with industry, this will enable analysis of scenarios for future demand of individual energy carriers, calculation of energy saving potentials and impacts on emissions and abatement cost curves, ex-ante policy impact assessments, and investigation of long-term sustainable energy transition scenarios. In order to make sectoral and integrated assessment modelling analyses comparable and meaningfully interlinked, we will link top-down and bottom-up modelling, by harmonising inputs and/or data for sequential integration of the exercises. In line with efforts to analyse the robustness of the modelling outcomes, we will also carry out index decomposition analysis[64], by classifying the robustness of IAM results based on both the range of contributions of the main mitigation levers and a comparison with bottom-up sectoral models results[65].

The modelling ensemble features the capacity to explore and map the implications of uncertainty in key assumptions and parameters into implied distributions of outputs (e.g. emissions, energy and prices, trade patterns), via scenario and sensitivity analysis or Monte Carlo simulations. To improve robustness of modelling outcomes and provide policymakers with information on the level of certainty over selecting near-optimal technologies or policies[66,67,68], this capacity will be reinforced by soft-linking model inputs and outputs (e.g. technological and behavioural measure subsidisation, taxation on emissions, other SDG dimensions) with portfolio theory[69]. Apart from assuming stochastic uncertainty of results, by considering that different plausible futures may encompass a large range of uncertain factors with various effects, non-probabilistic uncertainty (such as discrete robust optimisation) will also be explored, to determine optimal portfolios of policies/technologies performing well independently of any scenario's realisation[70].

To make modelling exercises meaningful and transparent and outcomes policy-relevant, significant effort will be put into opening the scientific processes to stakeholders, seeking how to scale well-proven methods of deliberative democracy to reach critical mass. This goes beyond the open nature of models (part of our modelling suite will be open source: GCAM, MUSE, ATOM and DREEM) and refers to the input data and scenarios driving these models. This is especially relevant for the civil society, the motives, strategies and concerns of whom must be thoroughly considered and addressed[71] when looking into behavioural aspects, allowing for increased ownership and therefore robustness of resulting policy prescriptions[1]. Aiming to design a harmonised and transparent framework, DESIRE will focus on defining common socioeconomic and technological parameters as well as scenario narratives for all modelling activities; and invest in clearly exploring the scope of modelling interlinkages, defining the capacity for data exchange, enabling sequential or parallel integration of the models, and allowing for model inter-comparisons.

1.4 Ambition

The innovation potential of DESIRE lies in the development of a ***pathbreaking assessment framework*** that couples modelling activities with research from social sciences and humanities, increasing the level of integration along the duration of DESIRE: from bridging, to converging, to merging, ***in line with the three Objectives and components***:

- Agent-based models and research in social sciences will work in parallel but establish bridges between them towards scaling up innovation, from individuals to large social units. This will enable the creation of user "archetypes" that can be linked to group behaviour and, together with innovation systems aimed at understanding how new lifestyles can be diffused into social norms, will eventually help explore behavioural diffusion based on real-life simulation models. In a second bridge, results will be supported by 'what if' scenarios that will allow the exploration of equality and justice in unprecedented detail, like energy poverty, marginalisation and gender aspects.
- In a converging setup, citizens will be directly involved in defining and legitimising the practices constituting low-carbon lifestyles, in a first-of-its-kind initiative-based learning process, via gamification and elements of discursive democracy. Citizens of different profiles will map conflicting or harmonious concerns, motivation and barriers; and comprehend impacts of their current and possible future lifestyle, on one another and on climate. Strengthening co-production processes will help capture different approaches to encouraging behaviour changes across communities of different age, culture, gender, income, etc.; thereby producing concrete policy recommendations.
- In the merging stage of DESIRE, insights from social sciences and agent-based models will be used to structurally modify and improve the employed models as well as to create a new GCAM-EU model, integrating society into the technology-economy-environment-policy nexus of the existing model framework. Analysis of socio-economic

differences, across income brackets and geographical areas that shape community and lifestyle behaviours and choices, will allow exploration of key societal/gender differences/inequalities and how these impact low-carbon lifestyle decisions, with a focus on local-level transitions. Standardisation of survey data used will allow integration into the model's database for future updates and reinforce the link between society and up-to-date climate science.

2. Impact

2.1 Expected impacts

In line with the call's explicitly mentioned expected contributions (**EC**), DESIRE will aim to achieve the following:

EC$_1$. Provide measurable support to the EU's long-term strategy on greenhouse gas emission reductions

Supporting climate policy in the EU, including the preparation of its long-term strategy on GHG emission reductions, is among the primary objectives of DESIRE. Integrated assessment and sectoral analyses in the EU will be carried out on regional and national levels, considering diverse scenarios across the broad lifestyle spectrum. This ***multi-layered modelling framework***, designed based on results of a locally situated micro-perspective via insights from research in social sciences and humanities in parallel with agent-based simulations, will be ***harmonised*** through benchmarking and index decomposition, and further ***reinforced*** by a series of uncertainty analysis techniques from portfolio theory. This will allow for robust, pragmatic and policy-relevant exercises pursuing the ***near-optimal***—rather than cost-optimal—policy and lifestyle portfolios that perform well across a spectrum of plausible futures in the longer run. Coupled with socio-technical narratives, the impact of these DESIRE outputs will be an improved design of ***a long-term strategy for promoting environmentally effective, politically feasible, financially viable, technically robust, socially acceptable and transformative pathways for sustainable development in the EU***. This will have an important impact on the ***feasibility and social realism of the European Green Deal*** and its framing of citizens as the driving force of transition. To ensure exploitation of our research, we will engage and keep updated ***policymakers at the EU level***, in a series of ***regional policy events*** as well as ***policy briefs*** associated with social innovation, sectoral development, transformative socio-political landscapes and transnational implications in the EU.

EC$_2$. Provide national and global pathways towards the Paris Agreement's global temperature goal and insights into how these can inform countries' next NDCs

Compared to hundreds of low-carbon transition pathways in literature[72] and databases (e.g. IPCC SR1.5 Scenario Explorer), there are just a handful of pathways that explicitly explore the implications of achieving ambitious mitigation in line with the Paris Agreement, when focused on lifestyle and behavioural changes[6,19,73]. A key DESIRE impact lies in linking the perspective of modelling technology portfolios for 1.5°C (techno-economic optimisation) with that of implementation contexts for these portfolios in different regions, countries and sectors, considering needs for adaptation and people's preferences and concerns, thereby making mitigation action socially realistic. There is a pressing need for ***more detailed exploration of such pathways and how they could feasibly come about***, including what policies, incentives and drivers would accelerate the adoption of such lifestyle changes. Integrating such analysis with ***full consideration of increasingly influential megatrends***, such as digitalisation, remains a major research agenda that DESIRE will address. The resulting pathways, which (for Europe) will be disaggregated by country, sector and timeframe, will form ***a valuable basis from which to draw evidence for the ratcheting phase of increased NDC ambition through the 2020s***, a process that is vital to the ultimate achievement of the Paris goals.

EC$_3$. Support the Stocktake Exercise by taking stock of collective progress towards the Paris Agreement goals and investigating how progress can be accelerated

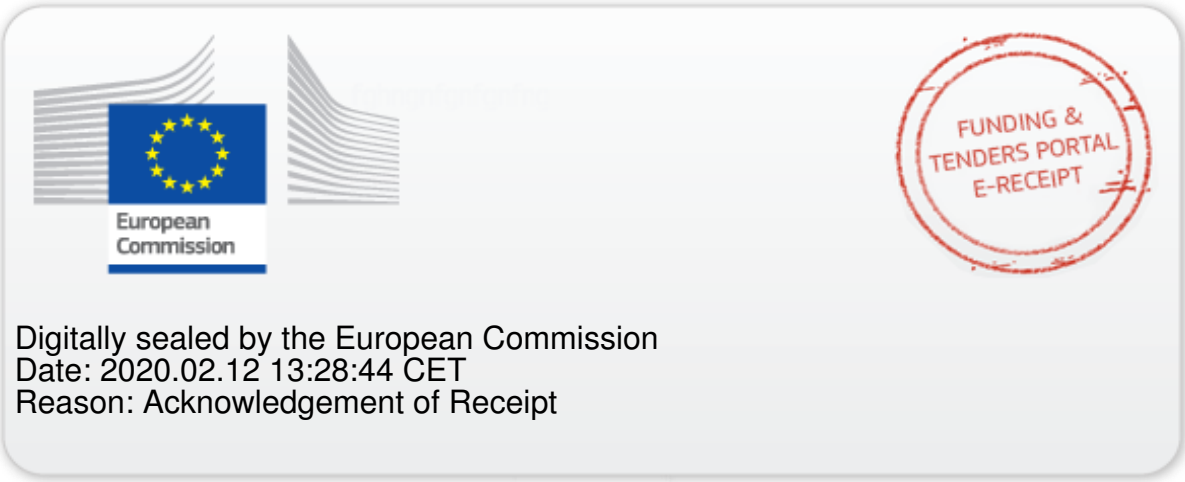
Related to the above production of feasible and detailed low-carbon transition pathways, DESIRE will feed directly into the Global Stocktake exercise, as a result of its geographical granularity, ***drawing insights and lessons from, and simulating pathways in, a number of European countries, the EU region, other countries representing major (Canada) and less (Kenya) emitting countries and the globe***. DESIRE's main impact will be the ability to concretely recommend and ***promote acceleration and scaling up of mitigation options*** (not limited to technological innovation, but including lifestyle and social innovation), as our methodology enables a deep understanding of willingness and opportunity for societal change. Given the need for acceleration of actions, DESIRE will be able to ***recommend action plans in different timeframes, which are technically feasible, economically viable and socially realistic***.

EC$_4$. Demonstrate how the latest climate science (including the 6th Assessment Report of the IPCC) can be converted into practical advice for national mitigation action

There has been significant progress by EU governments on operationalising insights from IPCC's SR1.5, but science is ever-developing and the AR6 cycle will lead to new insights on key considerations, such as our remaining carbon budget to limit temperature change in line with Paris, and viability of long-term technologies (e.g. NETs) to achieve this. DESIRE will integrate these insights into its modelling scenario design, ***to produce the most up-to-date and policy-relevant evidence on contribution of lifestyle and behavioural changes to transition pathways***. Development of an integrated and transparent scenario framework that proposes narratives around climate change triggering individual behavioural changes, along with an inclusive framework targeting policymakers, businesses and citizens,

will both ***help convert scientific outcomes into practical advice for national policymaking*** and ***inspire service providers and start-ups to innovate their product portfolio*** engaging broadly with consumers, while considering current and future needs that could emerge in the perspective of mitigating (or adapting to) climate change. It will also have an impact on industry, in ***informing business models and how market could be revolutionised*** by a differentiation in consumers' choices when mitigating or adapting to climate change. The DESIRE framework will finally have a societal impact as the behaviour change-based scenarios, co-created with citizens and properly divulgated at national, community, and household-level, will ***inform individuals on the magnitude and relevance of their choices in terms of climate change mitigation***. This stands both for European countries, and for countries outside Europe, directly in producing policy- and lifestyle-relevant results for Canada and Kenya, as well as indirectly in providing the EU with capacity to demonstrate feasibility of lifestyle changes to help mitigation to other countries.

[1] Doukas, H., Nikas, A., González-Eguino, M., Arto, I., & Anger-Kraavi, A. (2018). From integrated to integrative: Delivering on the Paris Agreement. Sustainability, 10(7), 2299.
[2] Trutnevyte, E. et al. (2019). Societal transformations in models for energy and climate policy: The ambitious next step. One Earth, 1(4), 423-433.
[3] Nikas, A. et al. (2019). A detailed overview and consistent classification of climate-economy models. In Und. Risks & Uncertainties. in Energy and Climate Policy (1-54).
[4] Wilson, C. et al. (2012). Marginalization of end-use technologies in energy innovation for climate protection. Nature Climate Change, 2(11), 780.
[5] O'Neill, B.C. et al. (2017). The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century. Global Environmental Change, 42.
[6] Grubler et al. (2018). A low energy demand scenario for meeting the 1.5 C target and sustainable development goals without negative emission technologies. Nature Energy, 3(6).
[7] Brynjolfsson, E. et al. (2017). Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics (w24001). Nat. B. of Ec. Res.
[8] Sorrell, S. (2009). Jevons' Paradox revisited: The evidence for backfire from improved energy efficiency. Energy policy, 37(4), 1456-1469.
[9] Darby, S., & Fawcett, T. (2018). Energy sufficiency: an introduction Concept paper. Energy Sufficiency project, eceee.
[10] Savona, M., & Ciarli, T. (2019). Structural changes and sustainability. A selected review of the empirical evidence. Ecological economics, 159, 244-260.
[11] Bain, P. G., & Bongiorno, R. (2020). It's not too late to do the right thing: Moral motivations for climate change action. Wiley Int. Reviews: Clim. Ch., 11(1).
[12] Wright, C., & Nyberg, D. (2019). Climate change and social innovation. In Handbook of Inclusive Innovation. Edward Elgar Publishing.
[13] Lopes, M. et al. (2020). Energy and behaviour: Challenges of a low-carbon future. In Energy and Behaviour (pp. 1-15). Academic Press.
[14] Gambhir, A. et al. (2018). Towards a just and equitable low-carbon energy transition. Grantham Institute Briefing Paper, (26).
[15] Sorman et al. (2020). Lost (and found) in Transition: Expert stakeholder insights on low-carbon energy transitions in Spain. Energy Research & Social Science, 64, 101414.
[16] Anderson, K., & Peters, G. (2016). The trouble with negative emissions. Science, 354(6309), 182-183.
[17] Rogelj, J. et al. (2015). Energy system transformations for limiting end-of-century warming to below 1.5 C. Nature Climate Change, 5(6), 519.
[18] Smith, P. et al. (2016). Biophysical and economic limits to negative CO 2 emissions. Nature Climate Change, 6(1), 42.
[19] van Vuuren, D.P. et al. (2018). Alternative pathways to the 1.5 C target reduce the need for negative emission technologies. Nat. Clim. Change, 8(5), 391.
[20] van den Berg et al. (2019). Improved modelling of lifestyle changes in Integrated Assessment Models: Cross-disciplinary insights from methodologies and theories. En. Str. R., 26.
[21] Zolfagharian, M., Walrave, B., Raven, R., & Romme, A. G. L. (2019). Studying transitions: Past, present, and future. Research Policy, 48(9), 103788.
[22] Sovacool, B. K. (2014). Diversity: energy studies need social science. Nature News, 511(7511), 529.
[23] Tàbara et al. (2017). Transforming communication and knowledge production processes to address high-end climate change. Environmental Science & Policy, 70, 31-37.
[24] Steg, L. (2018). Limiting climate change requires research on climate action. Nature Climate Change, 8(9), 759.
[25] van de Ven et al. (2018). The potential of behavioural change for climate change mitigation: a case study for the European Union. Mitig. and adapt. strategies for gl. change, 23(6).
[26] Watts et al. (2019). The 2019 report of The Lancet on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. The Lancet 394.
[27] Sachs, J. et al. (2019). Clustered spatially and temporally resolved global heat and cooling energy demand in the residential sector. Applied Energy, 250, 48-62.
[28] Hopkins, R. (2019). From What Is to What If: Unleashing the Power of Imagination to Create the Future We Want. Chelsea Green Publishing.
[29] Sari, R. et al. (2017). Energy Justice-a Social Sciences and humanities Cross-Cutting Theme Report. Shape Energy, Cambridge.
[30] Clancy, J. S. et al. (2003). The Gender-Energy-Poverty Nexus: Finding the energy to address gender concerns in development. DFID project CNTR998521.
[31] Kuokkanen et al. (2018). Agency in regime destabilization through the selection environment: the Finnish food system's sustainability transition. Research Policy 47(8).
[32] Moradi, A & Vagnoni, E (2018). A multi-level perspective analysis of urban mobility system dynamics: What are the future transition pathways? Tech. Forec. & Soc. Change, 126.
[33] Nikas, A. et al. (2017). Managing stakeholder knowledge for the evaluation of innovation systems in the face of climate change. Journal of Knowledge Management, 21(5).
[34] Sachs, J., Meng, Y., Giarola, S., & Hawkes, A. (2019). An agent-based model for energy investment decisions in the residential sector. Energy, 172, 752-768.
[35] Crow, D. J., Giarola, S., & Hawkes, A. D. (2018). A dynamic model of global natural gas supply. Applied energy, 218, 452-469.
[36] Kerdan, et al. (2019). A novel energy systems model to explore the role of land use and reforestation in achieving carbon mitigation targets: A Brazil case study. J. of Cleaner Prod.
[37] Stavrakas & Flamos (2020). A modular high-resolution demand-side management model to quantify benefits of demand-flexibility in the residential sector. En. Conv. & Man., 205.
[38] Stavrakas, V. et al. (2019). An agent-based model to simulate technology adoption quantifying behavioural uncertainty of consumers. Applied Energy, 255.
[39] Gnann, T. et al. (2018). The load shift potential of plug-in electric vehicles with different amounts of charging infrastructure. Journal of Power Sources, 390.
[40] Gnann et al. (2015). Modelling market diffusion of electric vehicles with real world driving data–German market and policy options. Trans. Res. Part A, 77.
[41] Plötz, P. et al. (2014). Modelling market diffusion of electric vehicles with real world driving data—Part I: Model structure and validation. Ecol. Econ., 107.
[42] Scoones, I. (2016). The politics of sustainability and development. Annual Review of Environment and Resources, 41, 293-319.
[43] Bridge, G., Barca, S., Özkaynak, B., Turhan, E., & Wyeth, R. (2018). Towards a political ecology of EU energy policy. In Advancing Energy Policy (pp. 163-175). Palgrave Pivot.
[44] O'Brien, K. (2015). Political agency: the key to tackling climate change. Science, 350(6265), 1170-1171.
[45] Routledge, P., Cumbers, A., & Derickson, K.D. (2018). States of just transition: Realising climate justice through and against the state. Geoforum, 88, 78-86.
[46] Wapner, P., & Elver, H. (Eds.). (2016). Reimagining climate change. Routledge, Oxford, UK.
[47] Milkoreit (2016). The promise of climate fiction: imagination, storytelling, and the politics of the future. In Reimagining climate change, Routledge, Oxford.
[48] Nikas, A., Doukas, H., & López, L. M. (2018). A group decision making tool for assessing climate policy risks against multiple criteria. Heliyon, 4(3), e00588.
[49] Song, Lieu, Nikas et al. (2020). Contested energy futures, conflicted rewards? Low-carbon transition risks and governance dynamics in China's built environment. ERSS, 59.
[50] Labella, A. et al. (2017). AFRYCA 2.0: an improved analysis framework for consensus reaching processes. Progress in Artificial Intelligence, 6(2), 181-194.
[51] Geels, F. W., Berkhout, F., & van Vuuren, D. P. (2016). Bridging analytical approaches for low-carbon transitions. Nature Climate Change, 6(6), 576-583.
[52] Bächtiger, A., & Parkinson, J. (2019). Mapping and measuring deliberation: towards a new deliberative quality. Oxford University Press.
[53] Nikas, A. et al. (2019). A semi-quantitative modelling application for assessing energy efficiency strategies. Applied Soft Computing, 76, 140-155.
[54] Nikas, A. et al. (2018). Barriers to and consequences of a solar-based energy transition in Greece. Environmental Innovation and Societal Transitions.
[55] Antosiewicz, M. et al. (2019). Pathways for the transition of the Polish power sector and associated risks. Environmental Innovation and Societal Transitions.
[56] Holtz et al. (2015). Prospects of modelling societal transitions: Position paper of an emerging community. Env. Innovation and Soc. Transitions, 17, 41-58.
[57] Pahl-Wostl, C., & Hare, M. (2004). Processes of social learning in integrated resources management. J. of Community & Applied Social Psychology, 14(3).
[58] Chappin, É. J. L. (2011). Simulating energy transitions. Next Generation Infrastructures Foundation.
[59] Poplin, A. (2012). Playful public participation in urban planning: A case study for online serious games. Computers, Environment and Urban Systems, 36(3).
[60] Campo, P.C., Bousquet, F., & Villanueva, T.R. (2010). Modelling with stakeholders within a development project. Environmental Modelling & Software, 25(11).
[61] Samadi et al. (2017). Sufficiency in energy scenario studies: Taking the potential benefits of lifestyle changes into account. Technological Forecasting and Social Change, 124.
[62] Creutzig, F. et al. (2018). Towards demand-side solutions for mitigating climate change. Nature Climate Change, 8(4), 260.
[63] Fleiter et al. (2018). A methodology for bottom-up modelling of energy transitions in the industry sector: The FORECAST model. Energy strategy reviews, 22, 237-254.
[64] Wachsmuth, & Duscha (2019). Achievability of the Paris targets in the EU—the role of demand-side-driven mitigation in different types of scenarios. Energy Efficiency, 12(2).
[65] Duscha et al. (2019). Achievability of the Paris Agreement targets in the EU: demand-side reduction potentials in a carbon budget perspective. Climate policy, 19(2), 161-174.
[66] Van de Ven et al. (2019). Integrated policy assessment and optimisation over multiple sustainable development goals in Eastern Africa. Environmental Research Letters, 14(9).
[67] Forouli et al. (2019). Identifying optimal technological portfolios for European power generation towards climate change mitigation: A robust portfolio analysis approach. Ut. P. 57.
[68] Forouli et al. (2019). Energy efficiency promotion in Greece in light of risk: Evaluating policies as portfolio assets. Energy, 170, 818-831.
[69] Nikas et al. (forthcoming). A robust augmented ε-constraint method for finding exact solutions of multi-objective linear programming problems. Journal of Global Optimization.
[70] del Granado et al. (2019). Investments in the EU Power System: A Stress Test Analysis on the Effectiveness of Decarbonisation Policies. Underst. Risks & Uncert. in En. & Cl. Pol.
[71] Turnheim et al. (2015). Evaluating sustainability transitions pathways: Bridging analytical approaches to address governance challenges. Global Environmental Change, 35.
[72] Hausfather, Z., & Peters, G. P. (2020). Emissions–the 'business as usual' story is misleading. Nature 577, 618-620.
[73] Napp et al. (2019). The role of advanced demand-sector technologies and energy demand reduction in achieving ambitious carbon budgets. Applied energy, 238, 351-367.



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