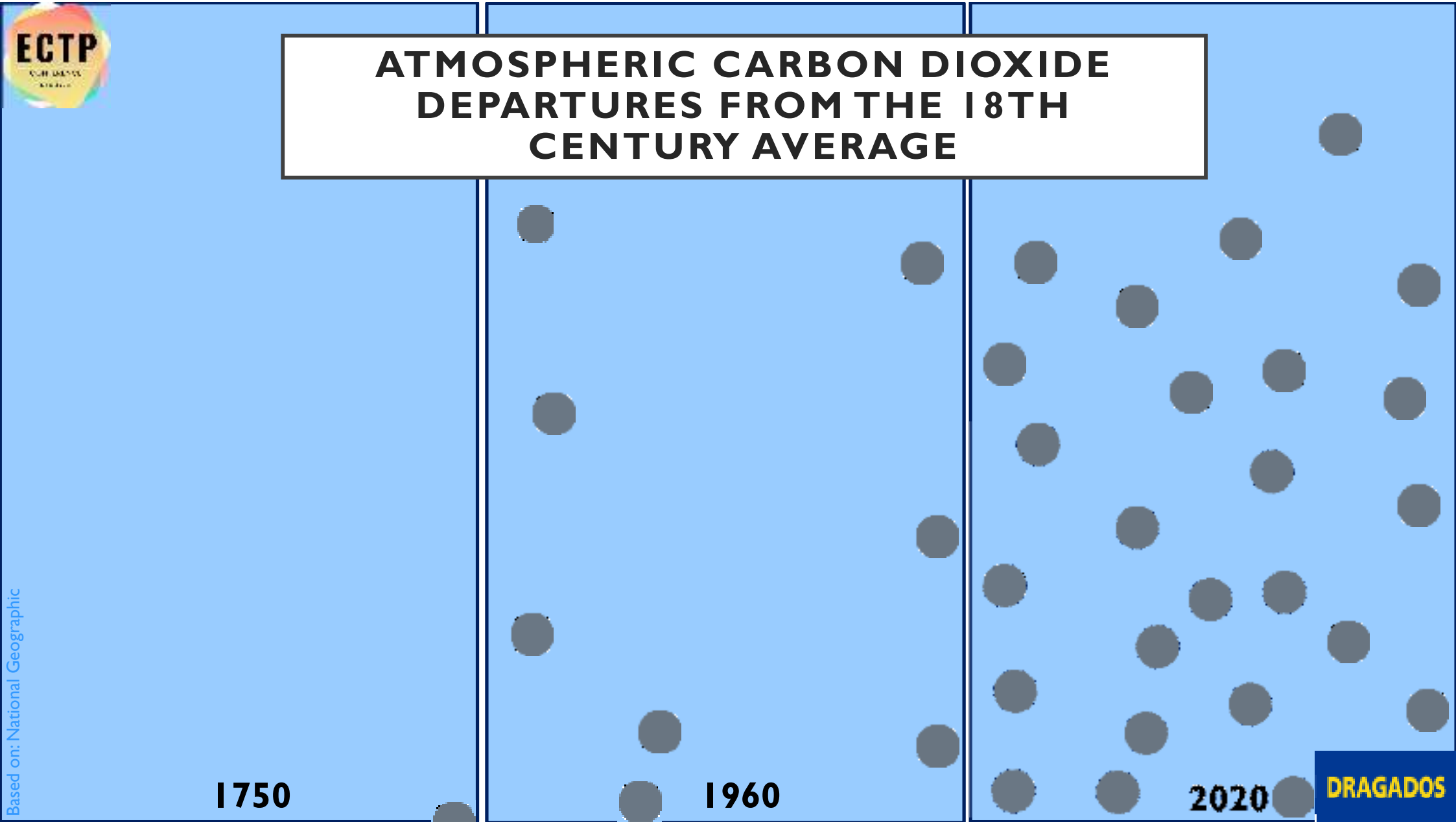
ADAPTATION & RESILIENCE OF THE EUROPEAN BUILT ENVIRONMENT TO NEW CHALLENGES AND THREATS

Dr. Miguel Segarra

Head of R&D and Innovation

DRAGADOS

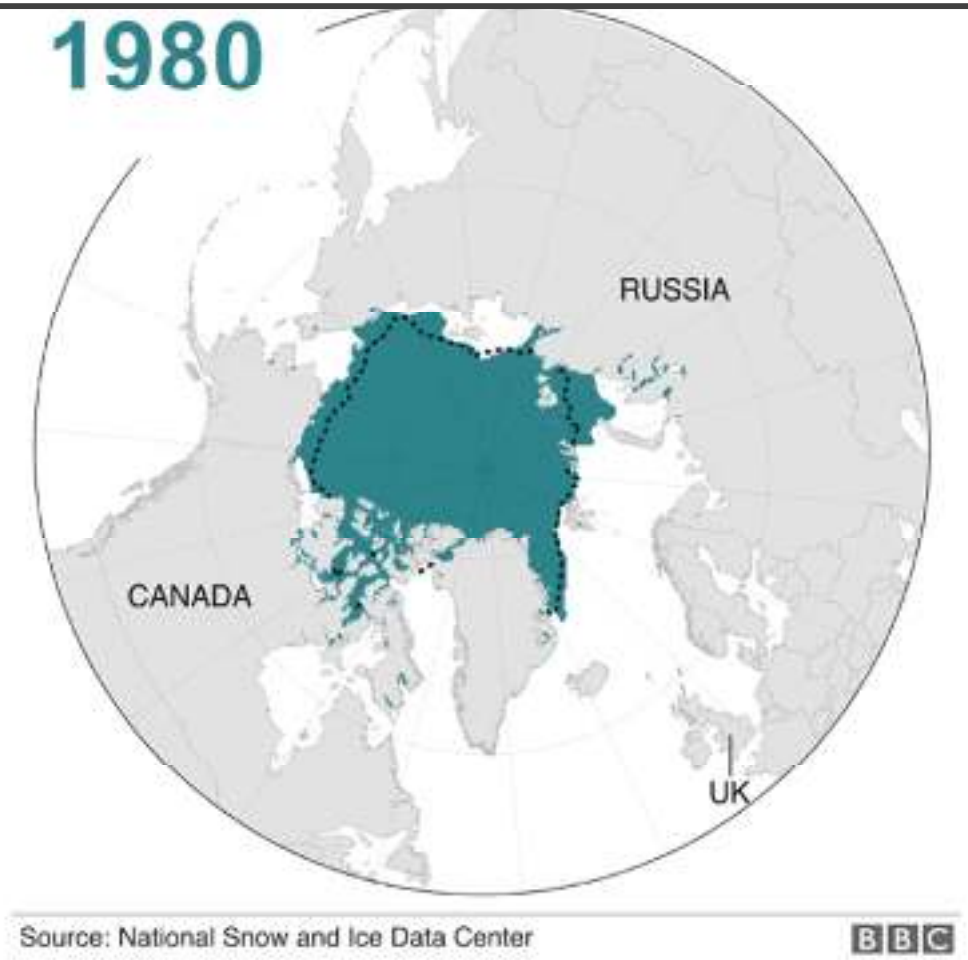
ATMOSPHERIC CARBON DIOXIDE DEPARTURES FROM THE 18TH CENTURY AVERAGE



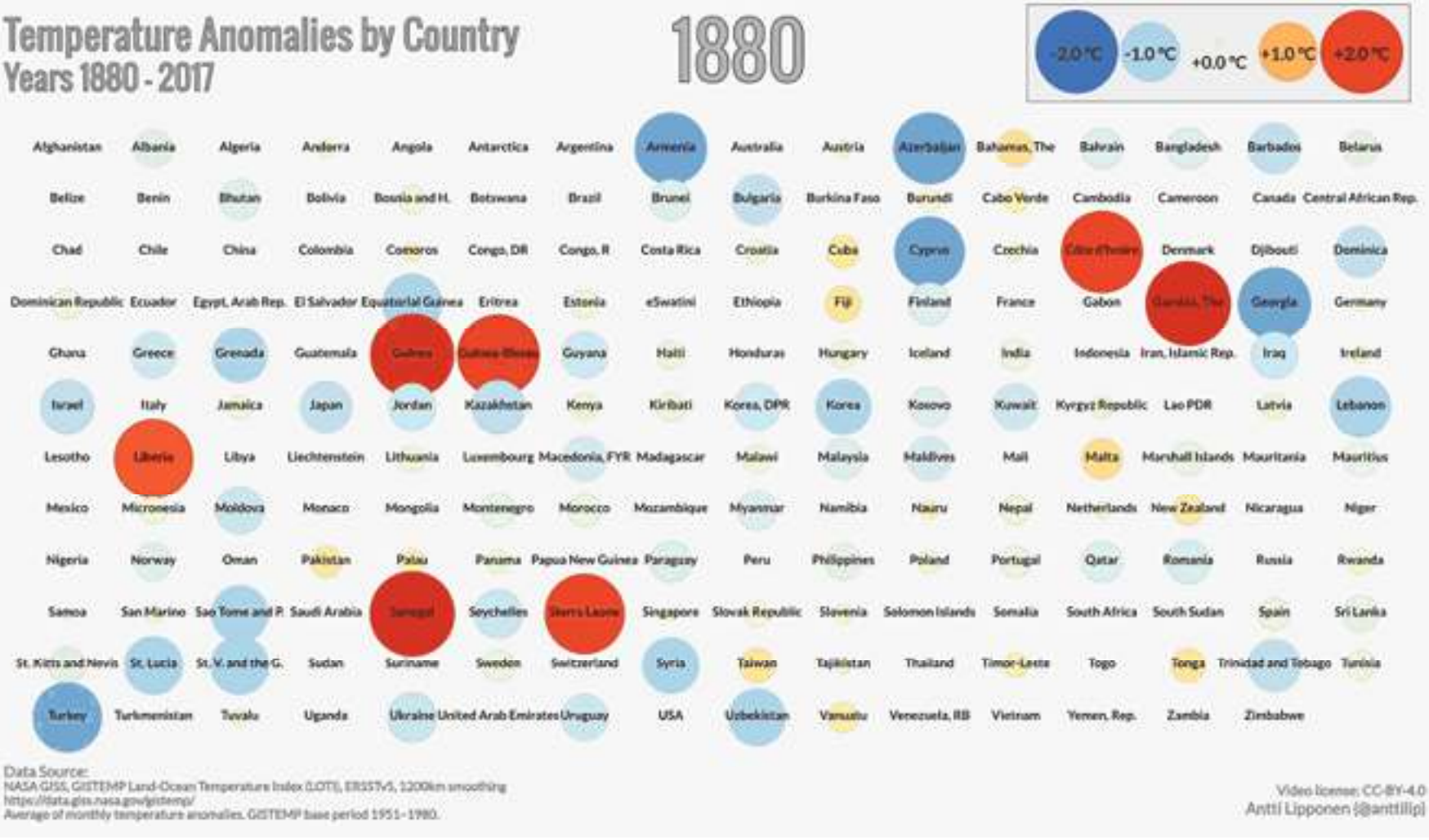
Based on: National Geographic

DRAGADOS

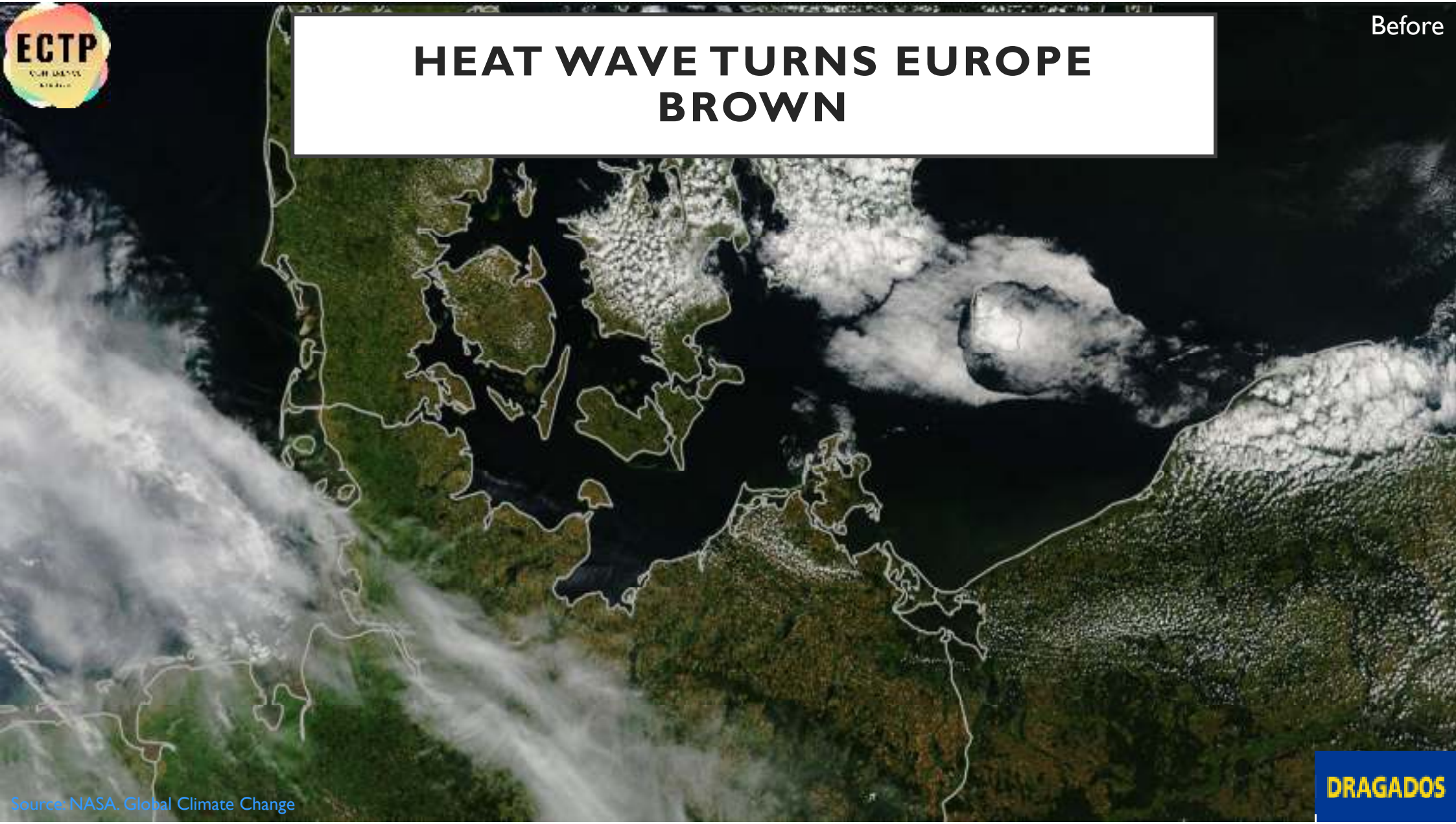
ARTIC SEA ICE MINIMUM EXTENT



TEMPERATURE ANOMALIES

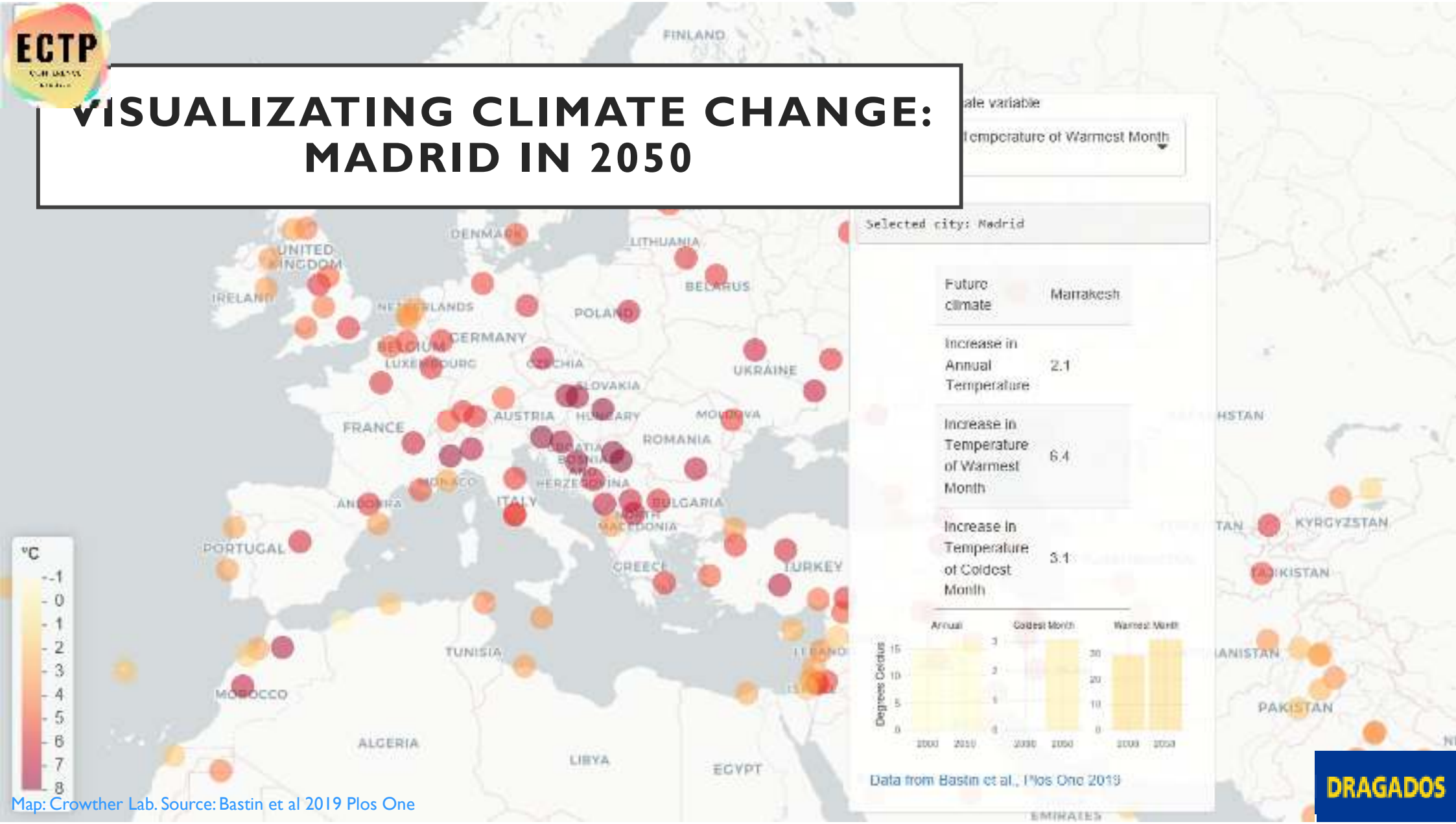


HEAT WAVE TURNS EUROPE BROWN



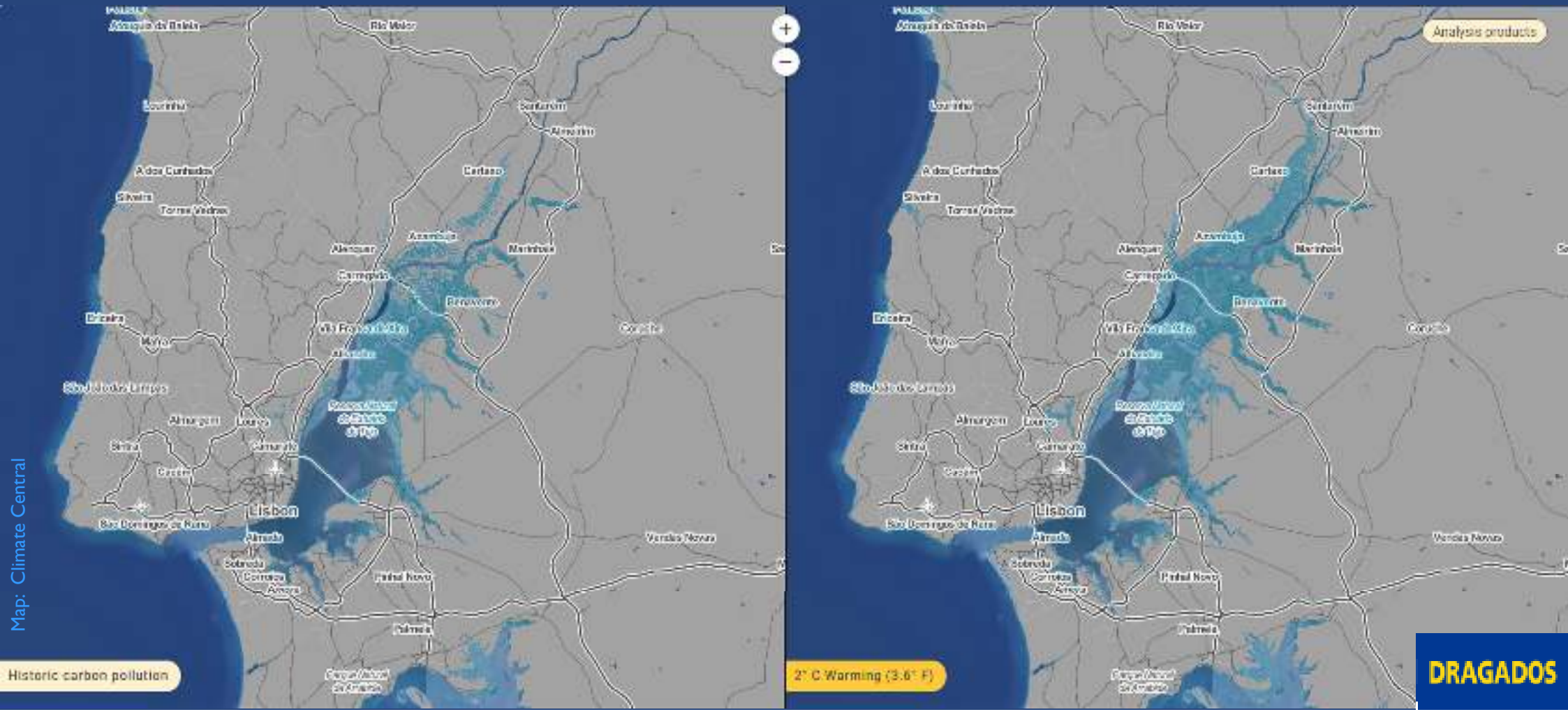
Source: NASA. Global Climate Change

VISUALIZATING CLIMATE CHANGE: MADRID IN 2050



Map: Crowther Lab. Source: Bastin et al 2019 Plos One

WHICH SEA LEVEL WILL WE LOCK-IN?



Map: Climate Central

DRAGADOS

T OF CI RELATION LIM GE

#1 source of air pollution is traffic.

9 in10 people worldwide live in areas of high-particle pollution.

1/3 of C40 cities' emissions come from transport.

650 million city residents will face water scarcity in 2050.

60 % of emissions of C40 cities come from buildings and industries

6 million premature deaths per year are due to poor air quality.

1.6 billion city residents will face extreme heat by 2050.

98 % of C40 cities have already faced severe climate threats

75 % of all energy consumption occurs in cities.

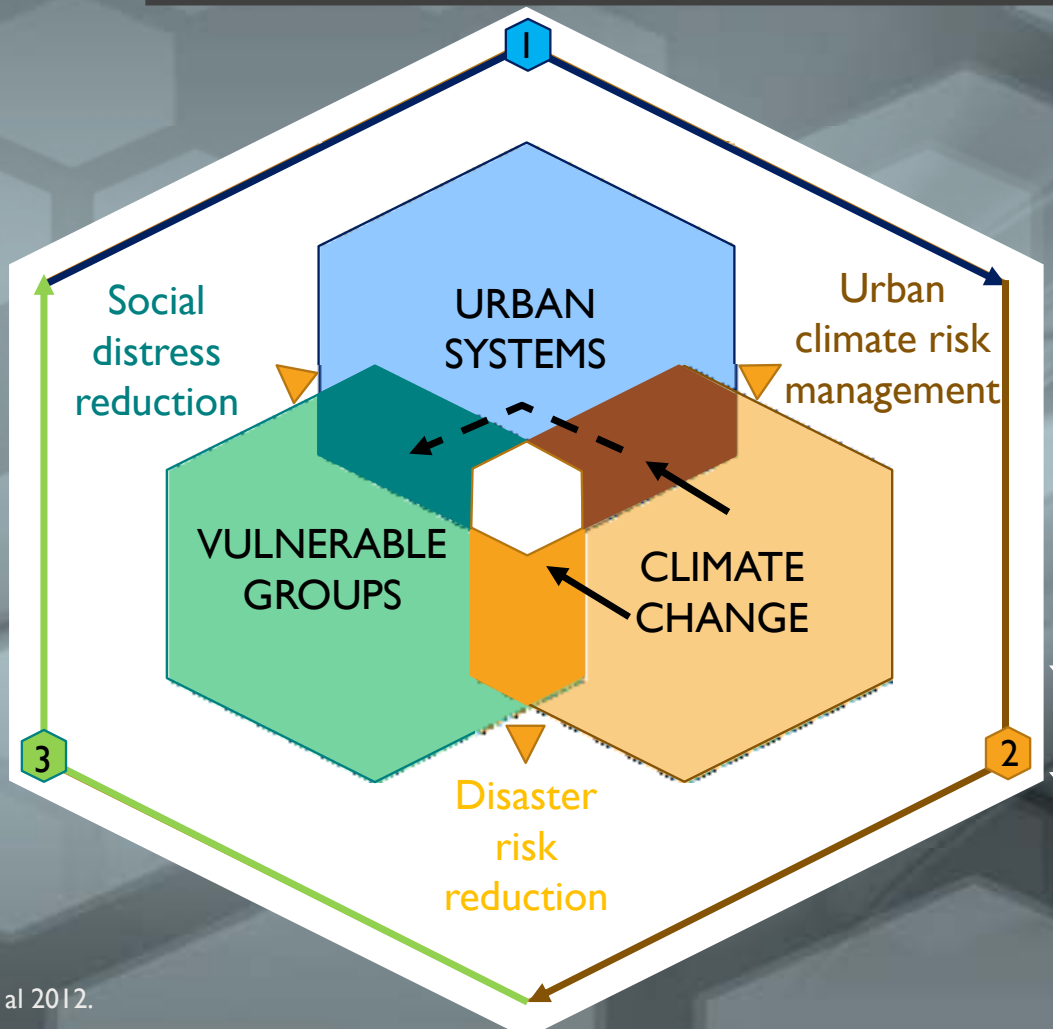
DRAGADOS

THE ROLE OF CITIES IN RELATION TO CLIMATE CHANGE

"As the majority of future humans will live in cities, it just makes sense that our solution to climate change will reside there too" ~ C40 Cities website.

DRAGADOS

MAINTAINING ESSENTIAL URBAN FUNCTIONS



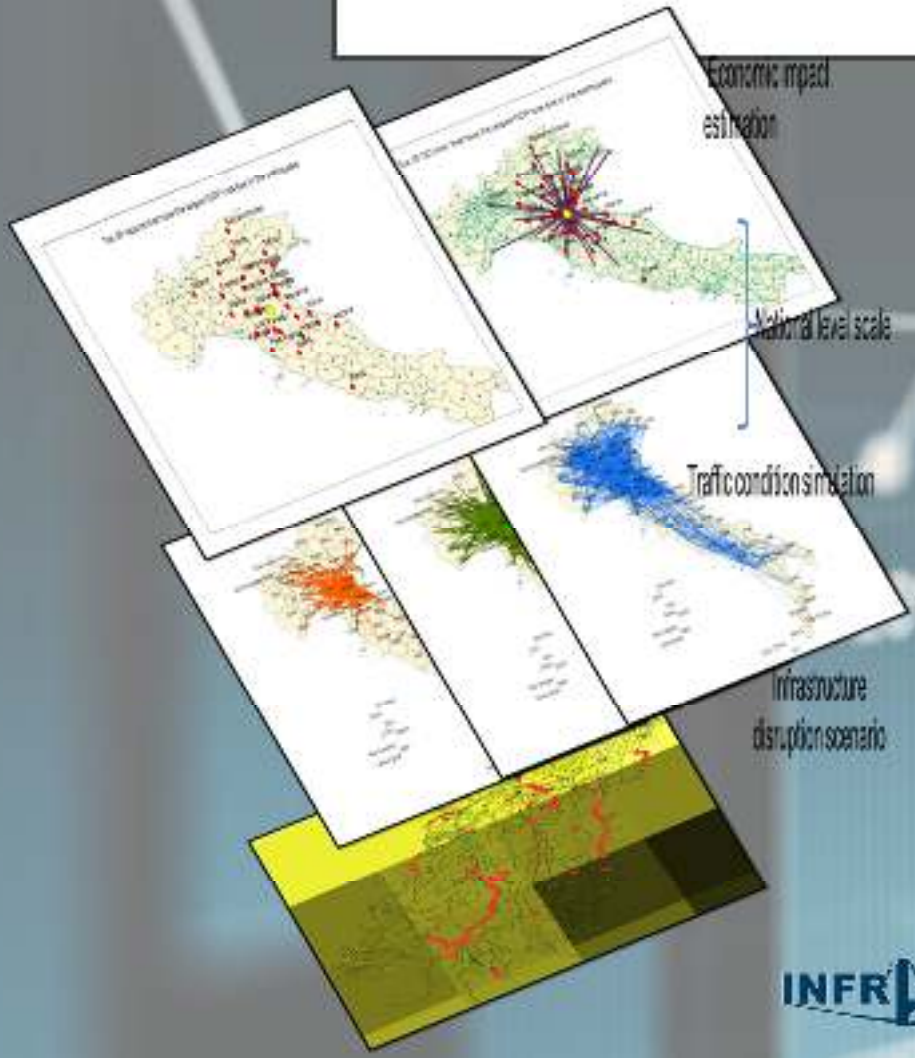
1. How does the city work?
2. Who is least able to respond to shocks and stresses?
3. What are the direct and indirect impacts of climate change?

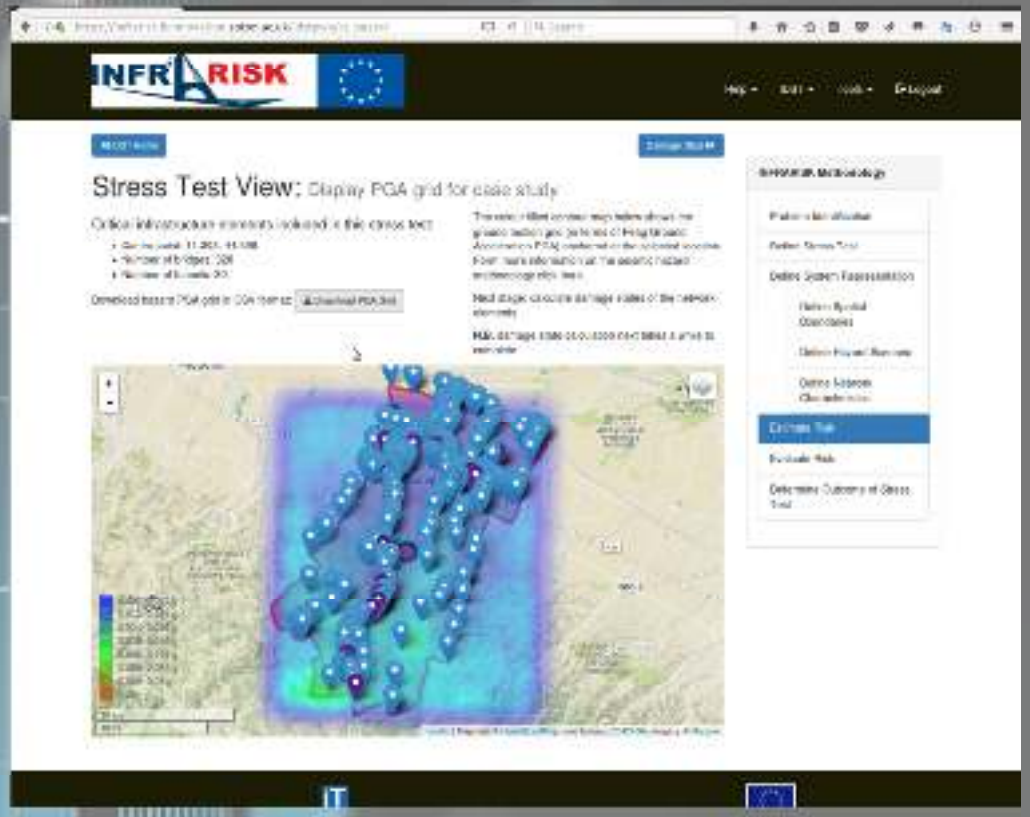
Direct impact

Indirect impact

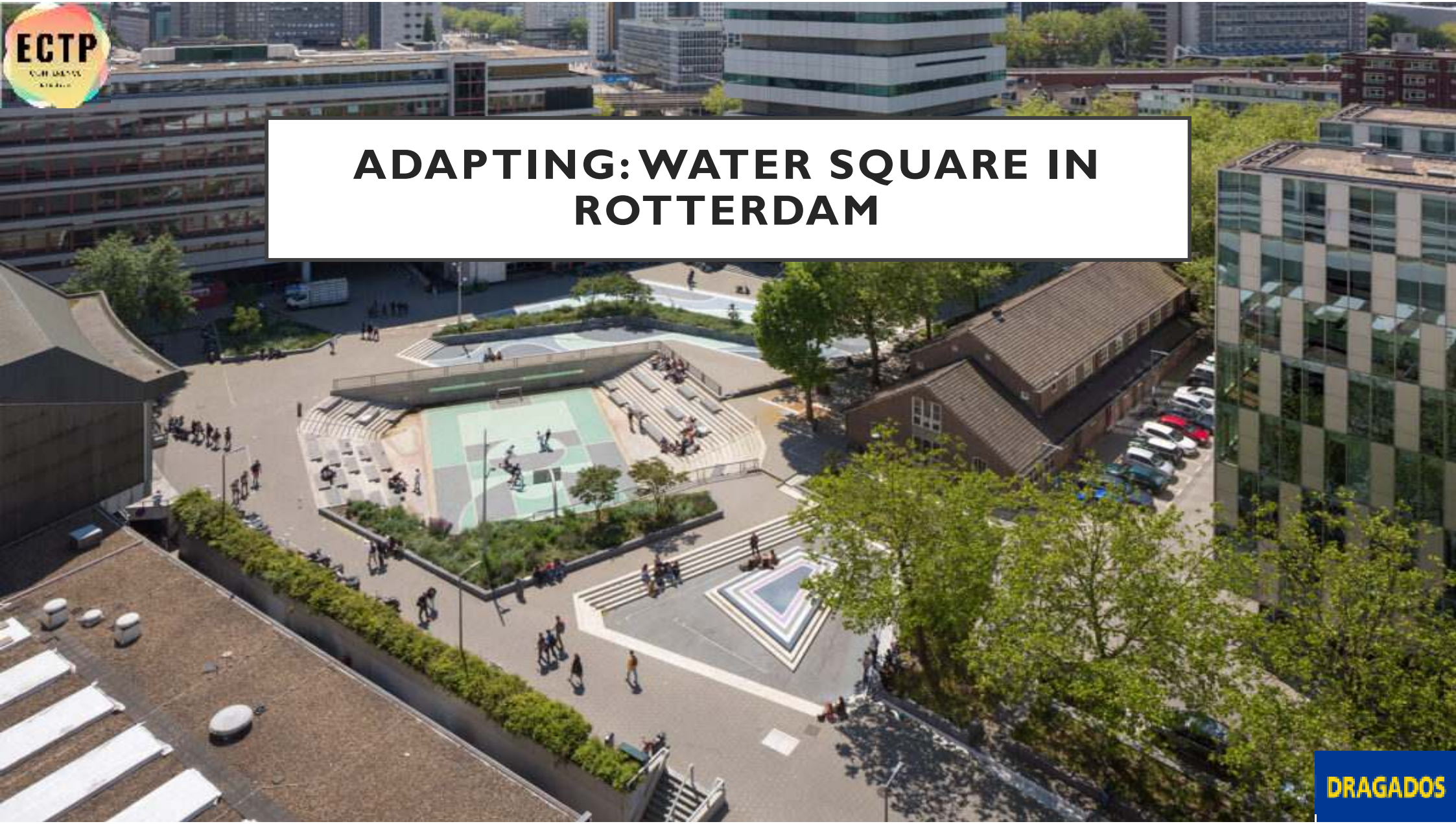
Based on da Silva et al 2012.

ASSESSING THE IMPACTS





ADAPTING: WATER SQUARE IN ROTTERDAM



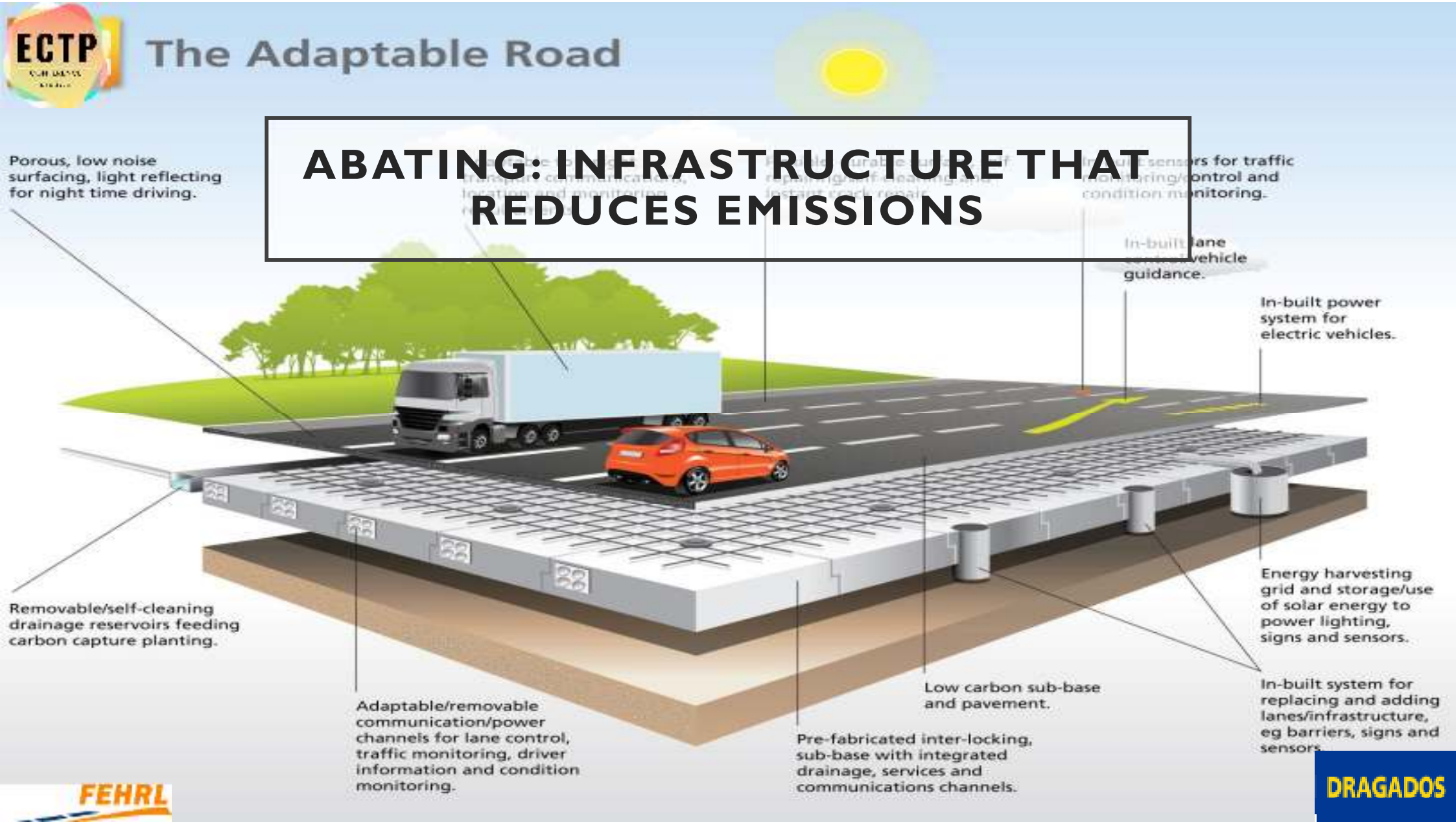
DRAGADOS

ADAPTING: STORMWATER ATTENUATION TANK IN MADRID

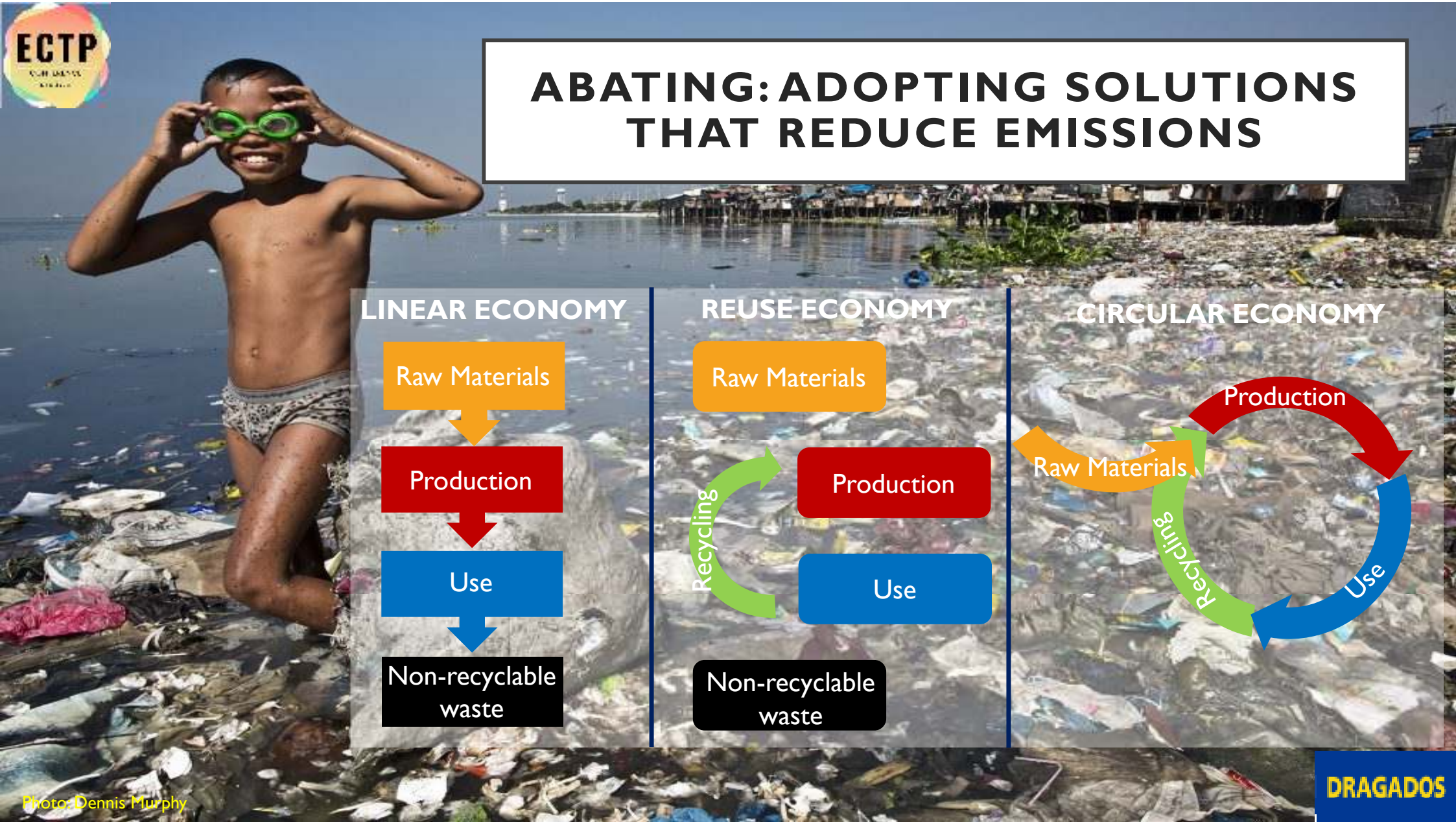
ABATING: BICYCLE GARAGE THE HAGUE PROVIDES 8,000 CYCLISTS WITH ROOM TO PARK IN "MUSEUM-LIKE" SPACE

DRAGADOS

ABATING: INFRASTRUCTURE THAT REDUCES EMISSIONS



ABATING: ADOPTING SOLUTIONS THAT REDUCE EMISSIONS



ABATING: ADOPTING SOLUTIONS THAT REDUCE EMISSIONS

Source: The Lancet - Integrating solutions to adapt cities for climate change

DRAGADOS

QUESTIONS FOR TODAY

1) THE FUTURE BUILT ENVIRONMENT IN RESPONSE TO CLIMATE CHANGE MITIGATION AND ADAPTATION

2) THE NEW USE OF THE CITY, BUILDINGS AND INFRASTRUCTURES IN THE GREEN AND DIGITAL CONTEXT

3) THE ROLE OF THE CONSTRUCTION INDUSTRY TOWARDS A MORE RESILIENT, HEALTHY AND SAFE BUILT ENVIRONMENT

DRAGADOS