



PROGRESSING CLIMATE ADAPTATION STANDARDS, METRICS, FOOTPRINTING & MAINSTREAMING

4 December, EU Pavilion - Room Brussels (14.30 - 18.00)
COP25 - at IFEMA, Madrid

PANEL 1 | ADAPTATION

Moderator: Steven Ramage, GEO Secretariat



- 14:30** Opening Remarks & Introductions
- 14:35** Climate Change Adaptation: Challenges, Solutions and Tools

- *Climate change adaptation overview using European and International standards*
Doogie Black
- *Principles for a great adaptation plan and some practical examples of planning by using ISO 14090*
John Dora



- 15:00** Importance of metrics for enhancing adaptation ambition of NDCs

- *A proposal of metrics to assess the impact of adaptation actions' implementation*
Axel Michaelowa, Perspectives Climate Group



- 15:15** Group on Earth Observations (GEO) – The value of Earth observations to measure and support adaptation decision-making

- *COPERNICUS for Climate Action*
Frank Martin Seifert, European Space Agency (ESA)
- *EO contribution to German climate information services in support of climate adaptation*
Tobias Fuchs, Germany's National Meteorological Service - the Deutscher Wetterdienst (DWD)



- 15:40** Discussion and Q & A
- 16:10** Panel Summary & Closing Remarks
- 16:15** Break (30 mins)

Organized by:



PANEL 2 | MAINSTREAMING ADAPTATION & CARBON FOOTPRINTING

Moderator: Peter Boswell, EFCA



- 16:45** Opening Remarks & Introductions

- 16:50** Mainstreaming adaptation: meeting today's systemic and built environment challenges today

- *Mainstreaming the implementation of nature-based solutions in the Built Environment*
Sandeep Sengupta & Peter Boswell, IUCN/ThinkNature EU Horizon Programme
- *Developing guidance and tools for adaptation planning*
Jeshika Ramchund, EFCA



- 17:15** ISO14067: a powerful tool for quantification and reduction of the carbon footprint of a product.

- *The Italian Programme Operator CFI for the carbon management according to ISO standards*
Daniele Perrigotti, Director of Carbon Footprint Italy (CFI)
- *Costa Rica's CFP Programme Operator Experience*
Laura Mora, Ministry of Environment and Energy of Costa Rica (MINAE)
- *Chiesi Group: a key study for reducing the Carbon Footprint of a product in accordance with ISO 14067*
Sara Panigone, Chiesi pharmaceutical



- 17:40** Discussion and Q & A

- 17:55** Panel Summary & Closing Remarks

PANEL 1 – Adaptation

Moderator: *Steven Ramage, GEO Secretariat*

Climate Change Adaptation: Challenges, Solutions and Tools

Climate change adaptation overview using European and International Standards - **Doogie Black**



Principles for a great adaptation plan and some practical examples of planning by using ISO 14090 - **John Dora**

Importance of metrics for enhancing adaptation ambition of NDCs

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COPERNICUS for Climate Action – **Frank Martin Seifert**

EO contribution to German climate information services in support of climate adaptation – **Stefan Rösner**



Business case for ACC

- Strong business case – continually getting stronger!
- Asset management
- Supply / value chain resilience
- Accountability
- Liability
- Reputation
- Risk management
- Improving business resilience





Why Standards?

- Provides an ordered 'agreed' way of doing things
- Trust - it's written by adaptation professionals
- Demonstrate good practice to third parties
- Provides a recognised benchmark
- Use across sites nationally and internationally to provide consistent results



Current State of Play (ACC Standards):

- **ISO 14090** - Adaptation to climate change - Principles, requirements and guidelines
- **ISO 14091** - Adaptation to Climate Change – Risk assessments
- **ISO 14092** - Adaptation to Climate Change – Local Authority Focus
- **ISO 14097** - Framework and principles for assessing and reporting investments and financing activities related to climate change
- **European Standards (CEN-CENELEC)** – Embedding Adaptation to Climate Change into infrastructure standards



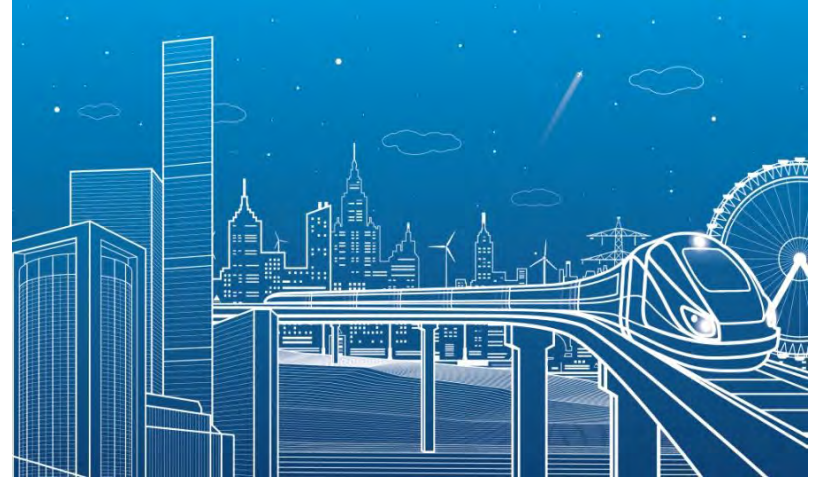
European Commission's ACC-CG Project (Phase 2)

3 ACC Practitioners:

- Bernard Gindroz
- Doogie Black
- John Dora
- *Project Lead is NEN*

Navigating Complexity:

- Asset lifecycles and uncertainty
- Inherent interdependencies
- Cascading Impacts / Multiple Hazards
- Different levels of support required for different standards and their Technical Committees (TCs)



13 CEN Infrastructure Standards Selected during Phase 1 (2015- 2017)

Buildings...

- Thermal performance of buildings
- Ventilation for buildings
- Sustainability of construction works
- Energy Performance of buildings



**13 CEN Infrastructure
Standards Selected
during Phase 1
(2015- 2017)**

Energy infrastructure and ICT...

Gas-infrastructures



LNG (Liquified Gas)



ICT Datacenters



**13 CEN Infrastructure
Standards Selected
during Phase 1
(2015- 2017)**

Transport infrastructures...

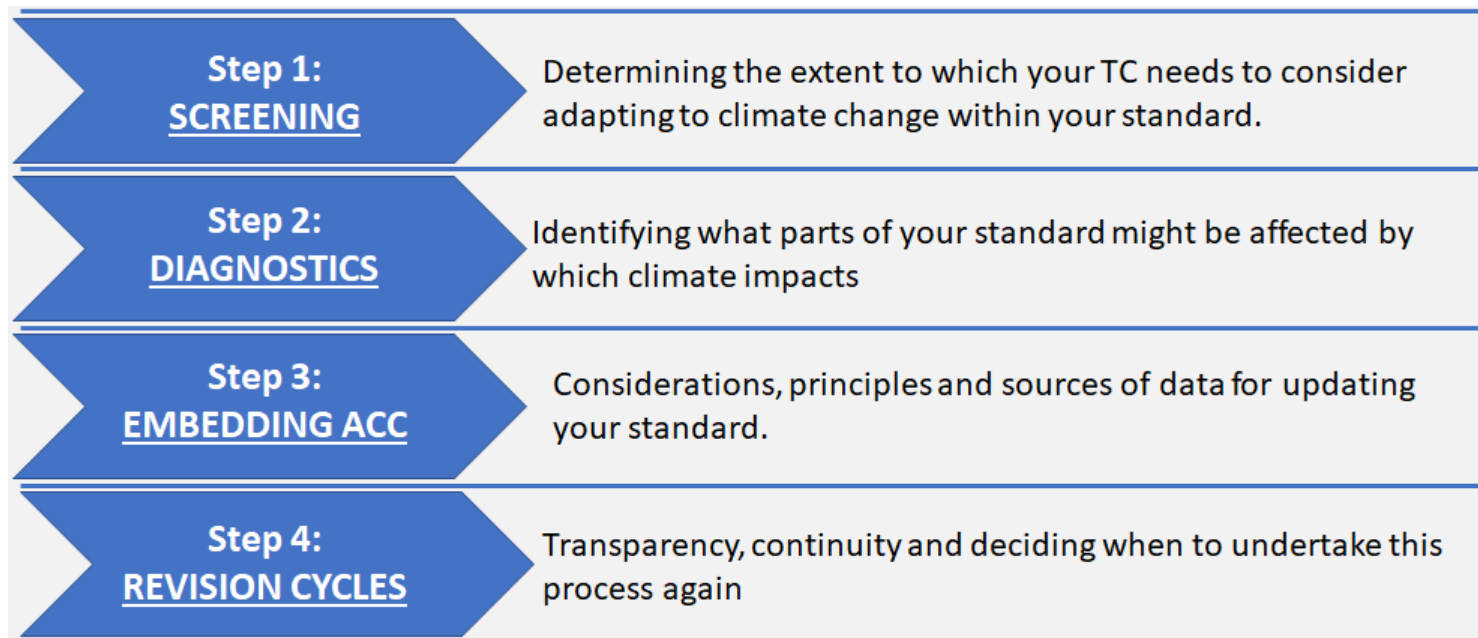
**Airfield ground
support
equipment**



Railways



Tailored Guidance (simple structure):



**CLIMATE
SENSE**

What's next:



- Testing guidance now with all the TCs over next 12 months
- Workshop in Spring 2020
- Application of guidance can be much broader than just EU
- Extent to new infrastructures
- Similar project for different sectors
- Inclusion of Euro Codes





Thank you

doogie.black@climatesense.global

Principles for a great adaptation plan

Using ISO 14090 - the first International
Best Practice Adaptation 'Guide'

CoP 25 Madrid 4th December 2019

European Pavilion

John Dora www.climatesense.global



What's the case for Adaptation?

- Strong business case – continually getting stronger!
 - Example: World Bank \$1 invested = \$4 benefit ([June 2019](#))
- Supply / value chain resilience
- Accountability
- Liability
- Reputation
- Risk management
- Improved business resilience in longer term

Wouldn't it be good to have a Framework to help?



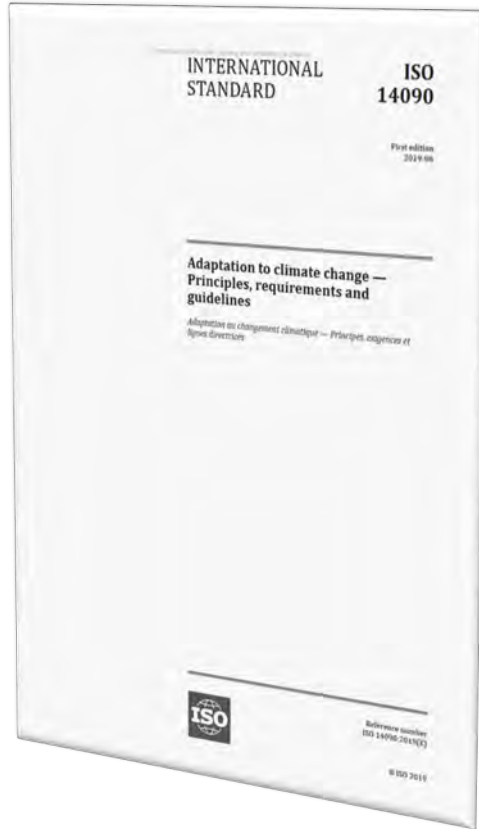
What challenges?

- Governance arrangements?
- Leadership and awareness?
- Short term thinking?
- Organisational capability?
- Understanding the terminology?
- Assessing impacts – risks/ vulnerability across varied business units?
- Narrow thinking?

Wouldn't it be good to have a Framework to help?



Good News!



ISO 14090 Adaptation to climate change – Principles requirements and guidelines was published in July – the **Framework!**

- Sets out an ordered ‘agreed’ way of doing things
- Trust - it’s written by adaptation professionals
- Can demonstrate international Best Practice to others – clients, investors, legislators
- Provides a recognised benchmark
- Use across sites nationally and internationally to provide consistent results

ISO 14090 covers all you thought about and more!



Applicable to **All** organisations, **Any** sector

- Takes a flexible approach
 - Applicable at any stage of adaptation
- Provides rigour
- Enables tailored solutions, not ‘one size fits all’
- Iterative – not linear
 - Use no matter what stage you are at in adaptation
- Embeds as ‘business as usual’
- Links to Paris 2016 and UN SDGs

ISO 14090 Key elements

Questions asked at outset on:

- Governance arrangements
- Leadership and awareness
- Life-cycle of products, activities, services
- Organisational capability – knowledge, resources
- Ability to assessing impacts – risks/ vulnerability/ thresholds
- Cross-cutting (systemic) matters
- Links to Paris 2016



Main sections

- Introduction
- Principles
- Pre-planning (Clause 5)
- Assessing climate change impacts (Clause 6)
- Adaptation planning (Clause 7)
- Implementation (Clause 8)
- Monitoring and Evaluation (Clause 9)
- Reporting and Communications (Clause 10)



ISO 14090 Examples of early users

- Large infrastructure organisations are involved in case studies aided by Climate Sense www.climatesense.global
 - Transport, energy, local government
- [National Trust](#) UK – forestry, castles, stately homes, paintings, coastline etc.
 - Keen to gauge their existing adaptation plans against ‘international best practice’
- In all of these we work with senior professionals to assess organisational ‘fitness for adaptation’. In line with ISO 14090 we are:
 - Reviewing adaptive capacity and decision making capability
 - Advising on leadership and governance
 - Seeing whether the resources – expertise and finance – are adequate
 - Looking at corporate understanding of risks out to future
 - Establishing the ‘Gaps’ in these areas so we can form a plan to address them

ISO 14090 Examples from infrastructure sector

How well are future climate impacts understood throughout your organisation, or your client's organisation?

- What impacts will extreme weather or slow-onset climate change have on your activities or services?

Do you know your exposure to weather hazards?

- Directly or indirectly; e.g. at your refinery? Or via your Suppliers?
- Are long supply chains resilient to weather patterns in e.g. the Pacific?

Have your installations been designed for the future climate?

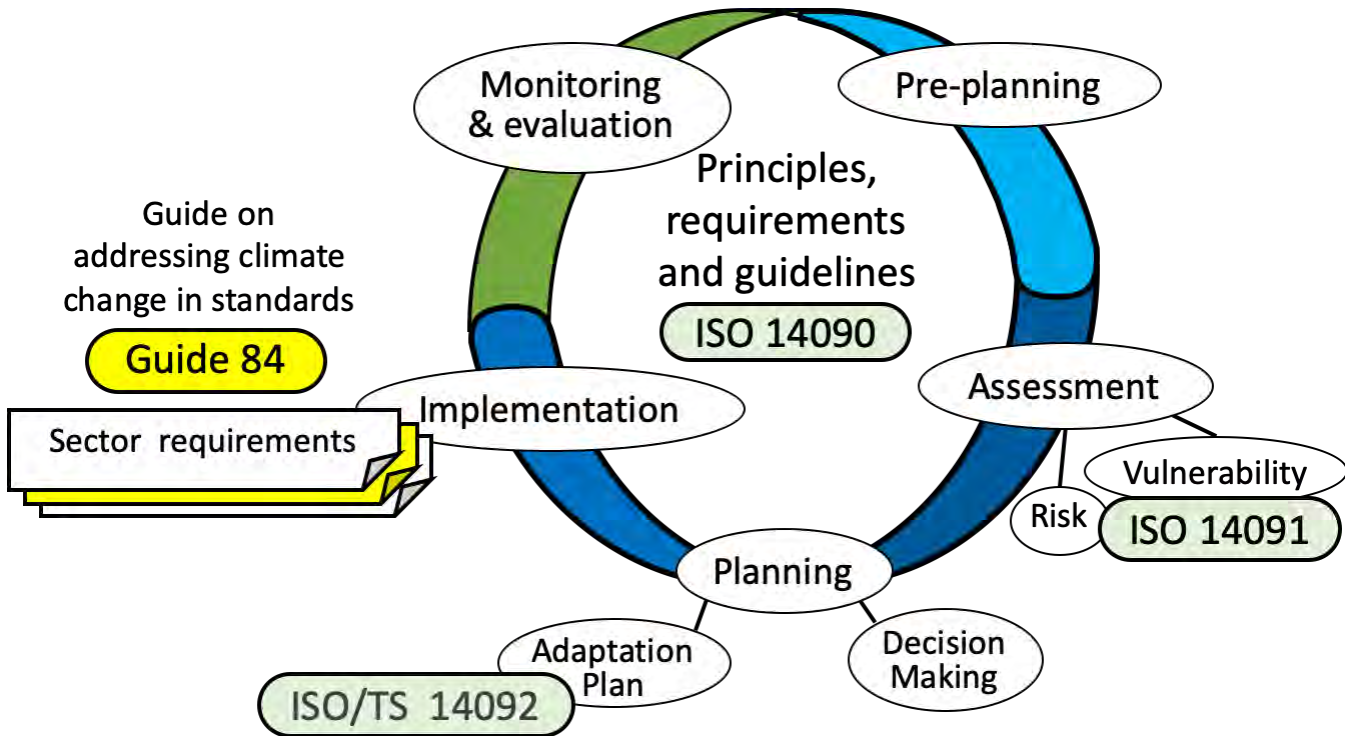
- Are the existing design, operation, maintenance standards fit for the next 30 years? 5 years? 50+ years?

Additional drivers

- UK Government Adaptation Reporting Power
- Investment banks wish to see climate resilient investments
- CSR pressures
- Recognition of immediate vulnerabilities on coastlines, due to rising sea levels (much industrial infrastructure is located here!)
- Systemic interdependencies for example:
 - Infrastructure management relies on Energy, ICT and on Transport – are these all resilient to the future climate?
 - Process industries use water, raw materials – are supplies resilient to the future climate?
- Climate changing rapidly



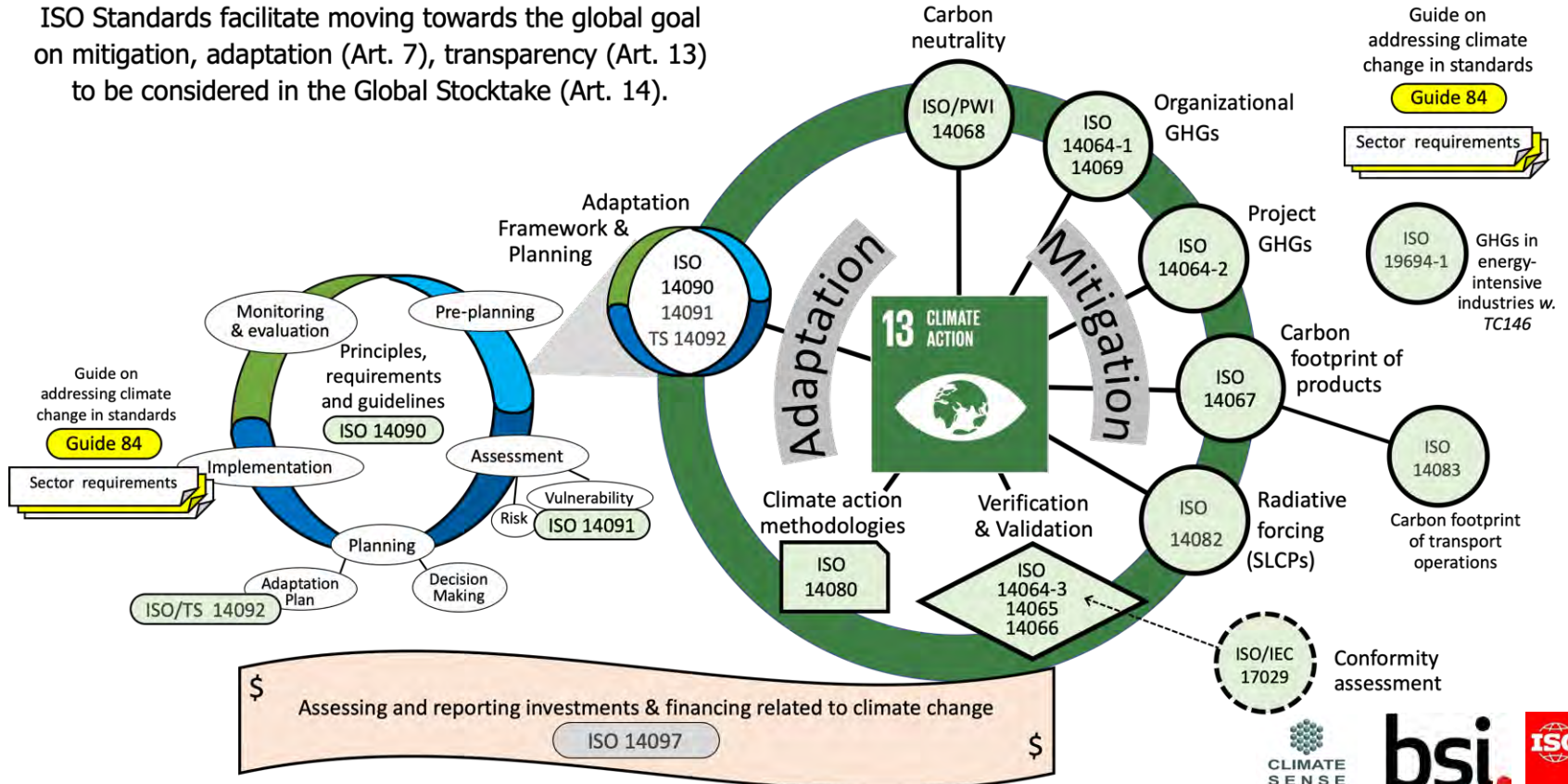
More to come – ISO Adaptation Strategy



ISO Standards on Mitigation and Adaptation

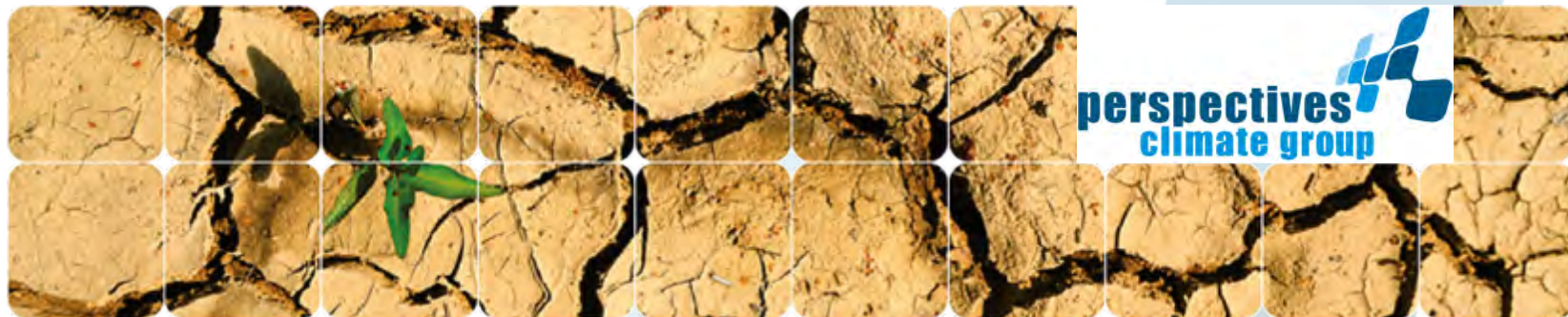
Paris Agreement

ISO Standards facilitate moving towards the global goal on mitigation, adaptation (Art. 7), transparency (Art. 13) to be considered in the Global Stocktake (Art. 14).



Thank you...

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John Dora www.climatesense.global



Adaptation metrics for increasing adaptation ambition: insights from the RE sector

Axel Michaelowa: Senior Founding Partner
michaelowa@perspectives.cc

EU Pavilion Side Event Progressing Climate Adaptation – Standards, Metrics, Footprinting and Mainstreaming, 4 December 2019



Agenda

- 1. Adaptation component of NDCs**
- 2. How to strengthen adaptation ambition of NDCs**
- 3. The importance of metrics**
- 4. Conclusions and recommendation**

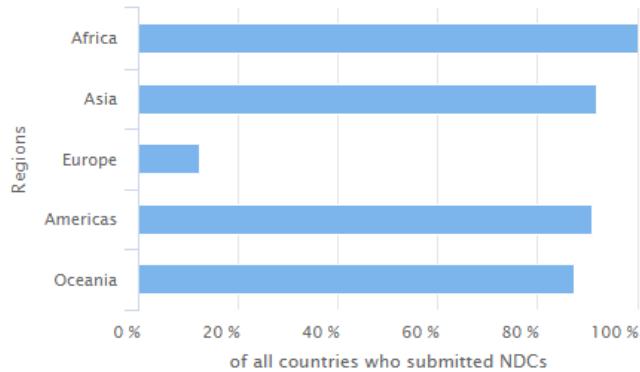


A photograph of a mangrove forest with dense green trees and prominent prop roots extending into the water. A semi-transparent grey box is overlaid across the middle of the image, containing the text '1. Adaptation components of NDCs'.

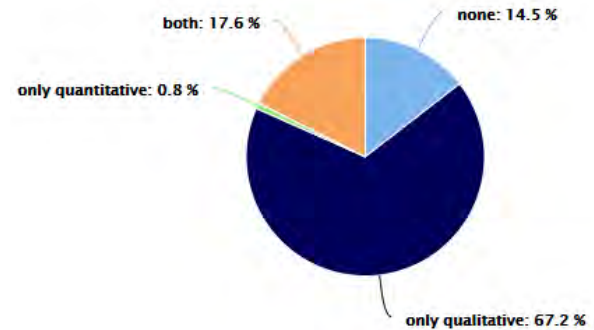
1. Adaptation components of NDCs

Adaptation components of NDCs

Share of NDCs with adaptation content



Quantitative vs. qualitative adaptation goals in NDCs with adaptation content



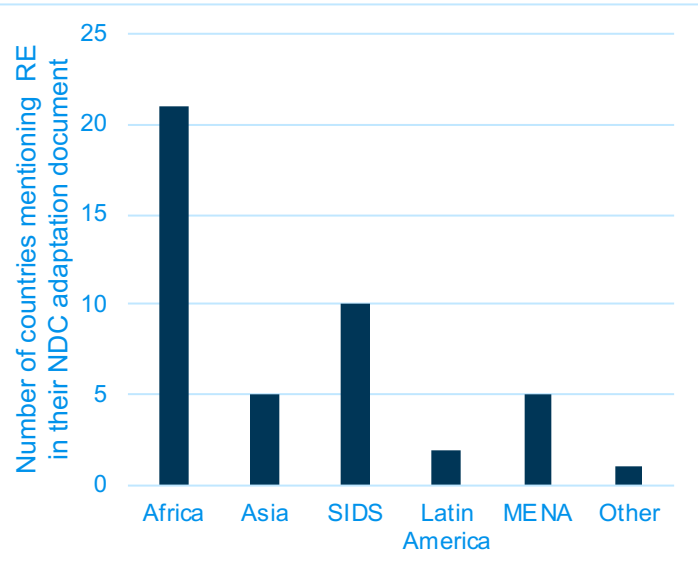
- **131 NDCs - 75% of NDCs - refer to adaptation**
 - **Only 18% include quantified goals for adaptation**
- ⇒ **How to assess progress made & raise adaptation ambition?**

Source: Tool for Assessing Adaptation in the NDCs (TAAN) - GIZ

<https://www.adaptationcommunity.net/nap-ndc/tool-assessing-adaptation-ndcs-taan/taan/#>

Adaptation target in NDCs: example of Renewable Energy

- **~40 countries mentioning RE in their NDC adaptation component**



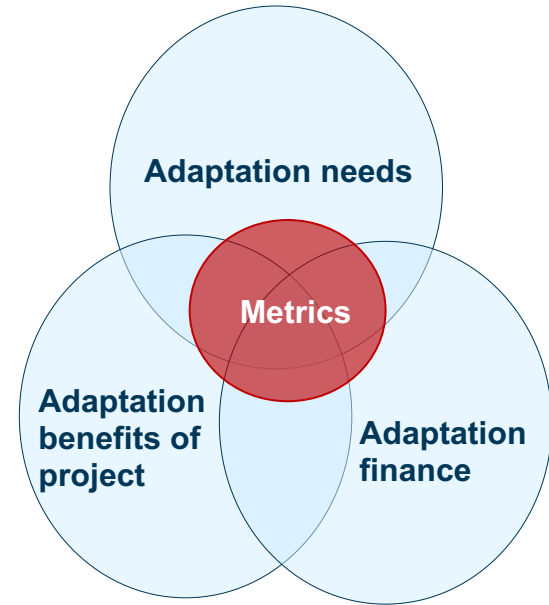
- Only 1/5 do include quantified targets for RE; most of those targets are related to the overall RE production target
- Only half mention the connection of RE development to adaptation, e.g. through
 - Diversification of the energy sector , energy service for drinking for drinking water supply or irrigation, adaptation of the energy sector , non energy service (flood management, water provision for irrigation), improve well-being.

A photograph of a mangrove forest with dense green trees and prominent prop roots extending into the water. The sky is clear and blue. A semi-transparent grey banner is overlaid across the middle of the image.

2. How to strengthen the adaptation ambition of NDCs

How to strengthen adaptation ambition of NDCs

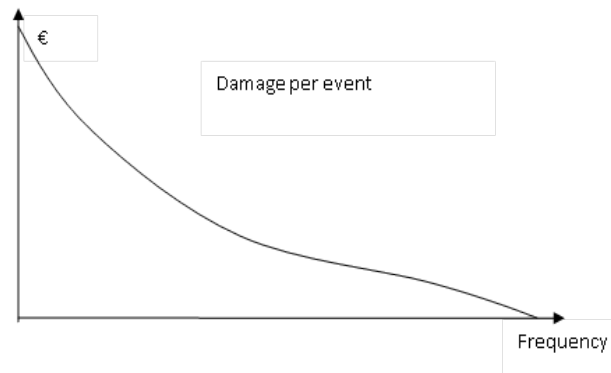
- **What is the real **adaptation need** and how is it reflected in the **NDC adaptation target**?**
- How does e.g. **RE** contribute to increasing **resilience**?
- **What is an **adaptation project**?**- Difference between **adaptation** and **development**?
- **How to assess that an **adaptation project** contributes to the **NDC adaptation target**?**
- **How to make sure that **adaptation finance** is really directed towards **adaptation**?**



Identification of adaptation projects (1/3)

Clearly define:

- **Baseline situation: business-as-usual situation in the project area including impacts of climate change but excluding the proposed project interventions**
 - **Already observed and predicted climate change impacts have to be reflected**
 - **Adaptation measures implemented in the past and expected autonomous adaptation form part of the baseline**
 - **Key issue: lifetime of adaptation intervention**
 - **Short lifetimes risk “maladaptation”**

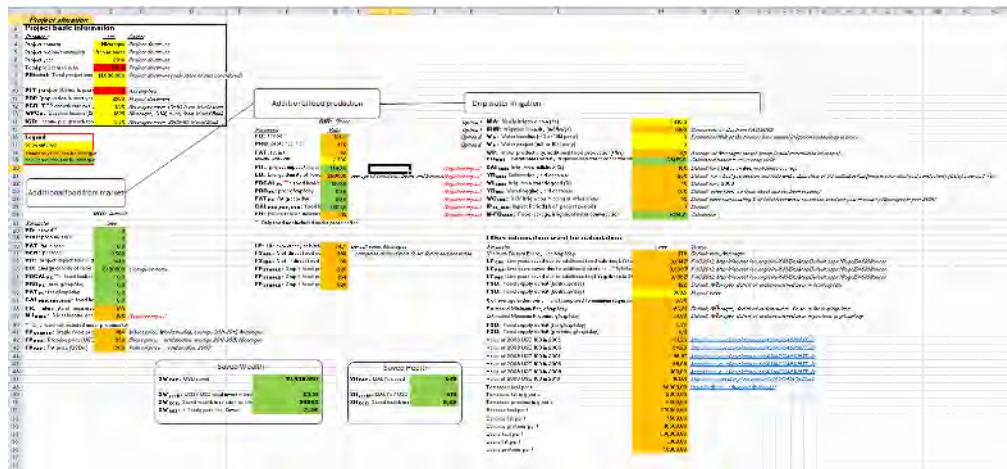


Identification of adaptation projects (2/3)

Clearly define:

- **Project scenario:** description of how the project implementation will enable to deviate from the baseline scenario

- Project scenario should clearly identify the different adaptation benefits expected (wealth, health, environmental benefits, etc.).



Identification of adaptation projects (3/3)

- **Differentiate Adaptation/Development/Mitigation projects**
- **Example with RE development:**
 - **Adaptation project:** RE solar pumping to maintain rain fed crops
 - Baseline: Rain fed crops. Climate change (**modification of rainfall patterns**) affects yields
 - Project scenario: drip irrigation enables to **maintain yields**
 - **Beware of maladaptation**, e.g. if water pumping **depletes groundwater**
 - **Development project:** RE solar pumping to diversify farmers' revenues
 - Baseline: no crop cultivation on the project site
 - Project scenario: develop a new crop with the use of drip irrigation
 - **Mitigation project:** RE solar pumping as an alternative to diesel pumps
 - Baseline: Drip irrigation with diesel pump
 - Project scenario: switch to RE solar pump

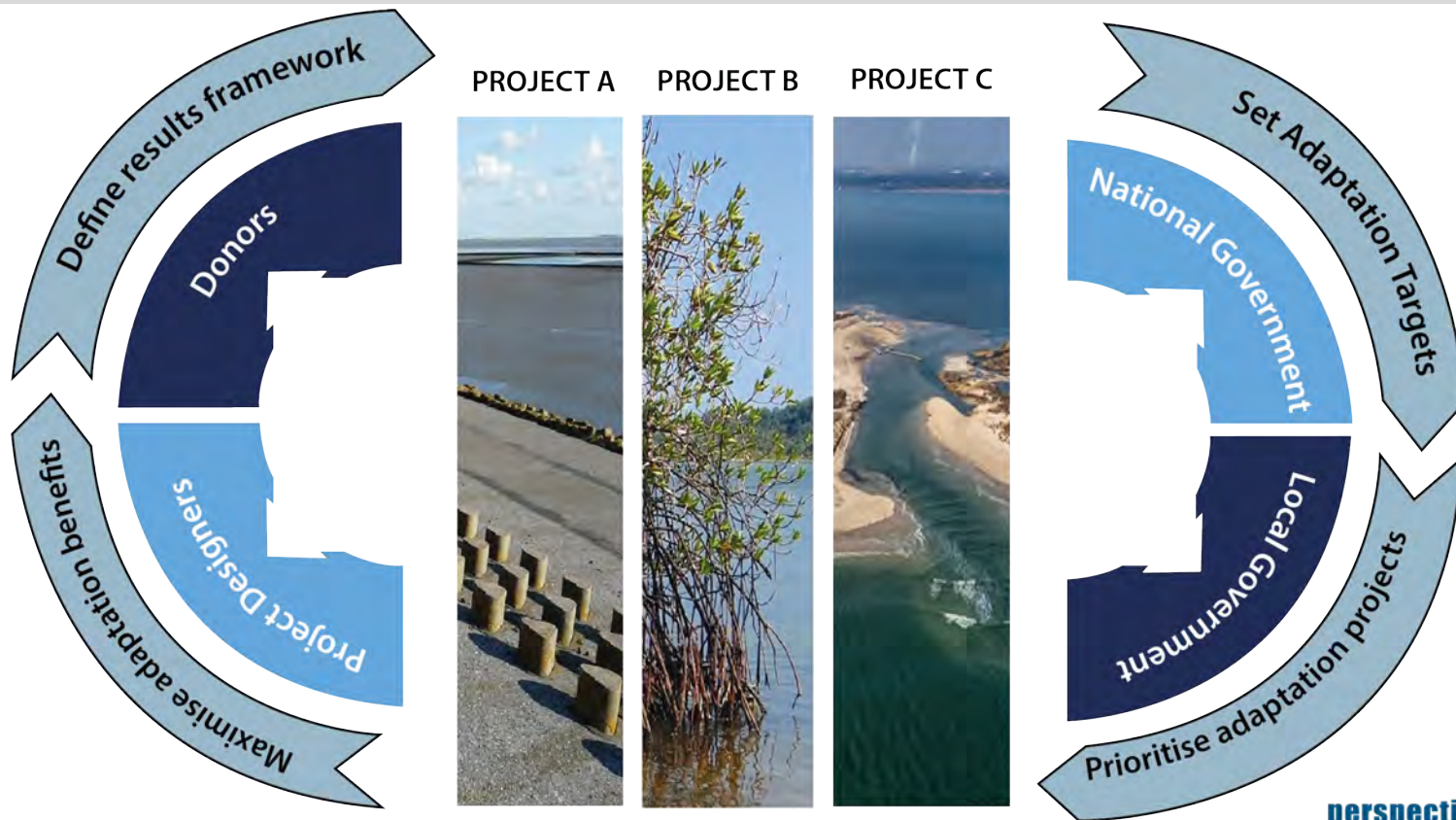
A photograph of a mangrove forest with dense green trees and prominent prop roots extending into the water. A semi-transparent grey rectangular box is overlaid across the middle of the image, containing the section header text.

3. The importance of metrics

The importance of metrics (1/2)

- **Relevance of taking into account the multiple benefits of projects (adaptation/sustainable development mitigation)**
- **Relevance of metrics for:**
 - **Increasing climate adaptation finance flows towards real adaptation projects**
 - **Improving the understanding of policymakers on the contribution of projects to the overall adaptation goal and thereby enable a more robust adaptation planning process for NDC implementation**

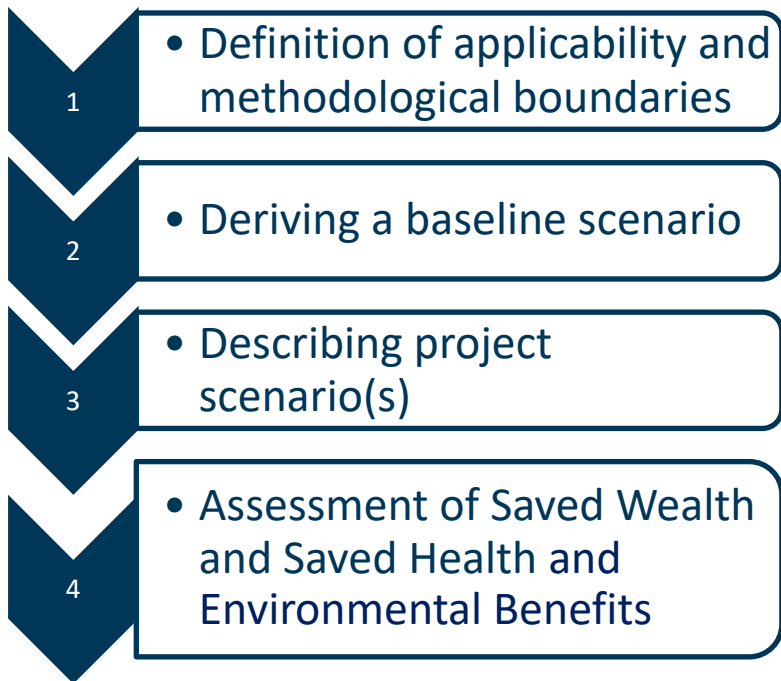
The importance of metrics (2/2)



Example of the Saved-Health/Saved Wealth metric (1/2)

- **Saved Health (parameter: Disability adjusted life years - DALY):** Positive health impact of the proposed project, primarily by **preventing deaths and illness due to climate change impacts.**
- **Saved Wealth (parameter: USD)** Positive economic impact of the proposed project, measured by **changes in economic assets during the project period compared to the baseline development.**
 - While it primarily focuses on **income** and **accumulated assets** endangered by climate change during the project period, other economic benefits are also accounted for

Example of the Saved-Health/Saved Wealth metric (2/2)



- **For each project type a new methodology needs to be developed**
- **Once the methodology has been developed, data needs to be gathered**
 - Project data preferable
 - Regional/national/international defaults are second choice
- **The methodology can then be applied to calculate SW/SH**

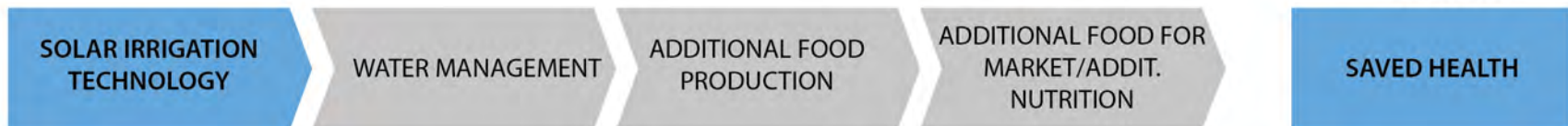
Example: Solar Irrigation Kenya

■ Baseline scenario:

- Rain-fed agriculture, insufficient water distribution and storage
- Manually operated irrigation systems
- Crops: Cabbage, onions and tomatoes
- Current negative impacts of irrigation: salinization, waterlogging, yield decreases

■ Project scenario:

- Solar irrigation technology



Credit: Sunculture

SAVED WEALTH



ADDITIONAL FOOD FROM MARKET (INDIRECT)

▲ +/- MARKET

▼ +/- ADDITIONAL NUTRITION

SOLAR IRRIGATION TECHNOLOGY

WATER MANAGEMENT

ADDITIONAL FOOD PRODUCTION

ADDITIONAL FOOD FOR MARKET/ADDIT. NUTRITION

SAVED HEALTH

Source: REEEP IMPAQT

Project adaptation benefits over ten years at different scales

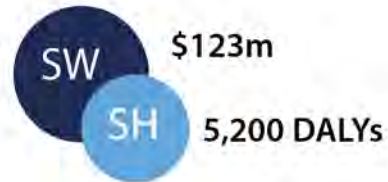


Scope 1: Rollout of 90 irrigation systems in Kenya



Donor Budget: USD 115,000

Scope 2: Increase project target to 1400 farms



Donor Budget: USD 1.5m

Scope 3: Kenya Solar Irrigation Potential



Image sources: Sunculture ASIK 2016 (Left), Futurepump 2016 (Right)

Conclusions and recommendations

- **If you want to really achieve adaptation, differentiate adaptation clearly from general development and mitigation**
 - Otherwise **backlash from climate finance providers** is likely
- **While there is a cacophony of voices that argue that adaptation benefits cannot be measured, we think this is possible!**
 - **Saved wealth and saved health**
- **We recommend national governments and climate finance providers to test adaptation metrics**
 - Fertile testing ground: **Adaptation Benefits Mechanism** under **Article 6.8**

Thank you for your attention

Axel Michaelowa
Senior Founding Partner

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COPERNICUS for Climate Action

Frank Martin Seifert
ESA Earth Observation Programmes

Progressing Climate Adaptation
European Pavilion
COP25 Side Event | 4 December 2019 | Madrid

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ESA Earth Observation

“Taking the Pulse of our Planet”



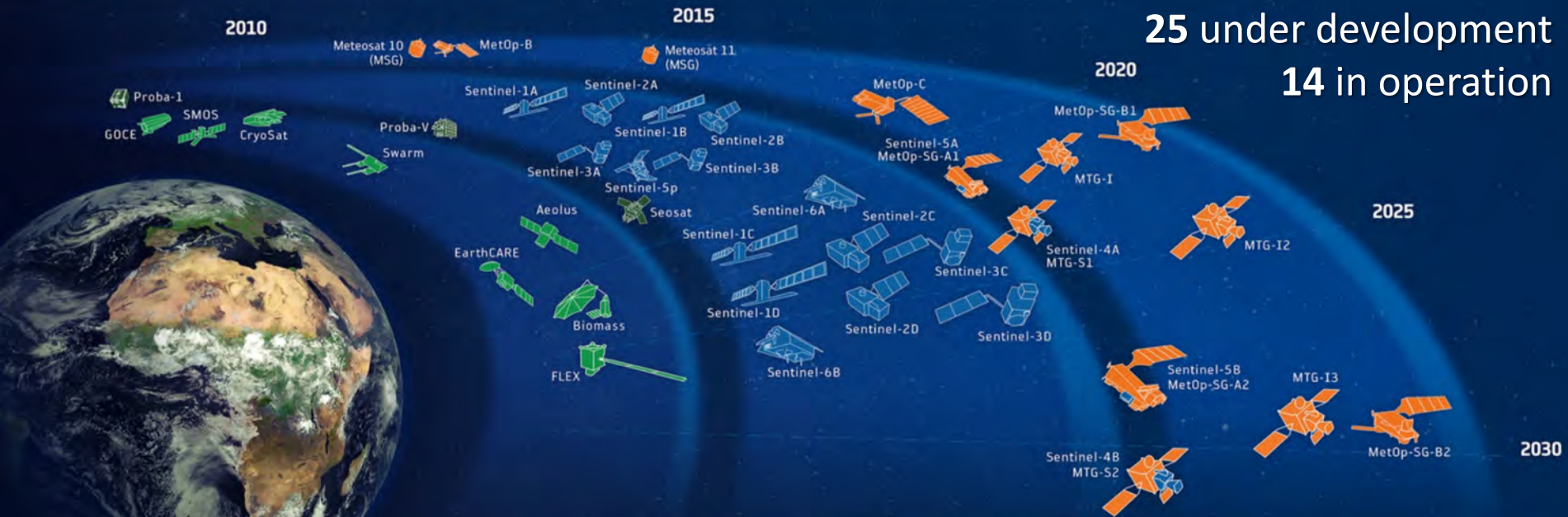
ESA-DEVELOPED EARTH OBSERVATION MISSIONS



Satellites

25 under development

14 in operation

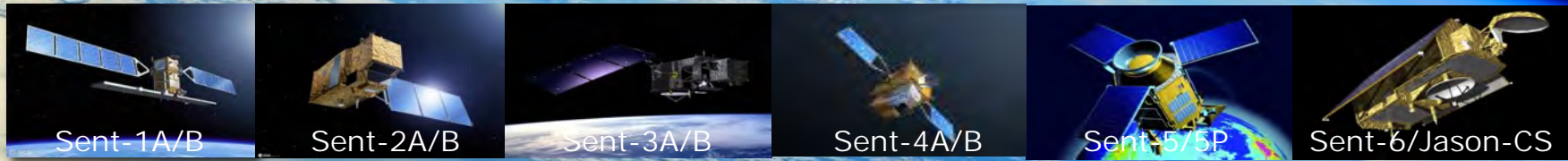


Science

Copernicus

Meteorology





- Copernicus is a European space flagship programme led by the European Union;
- Copernicus provides the necessary data for operational monitoring of the environment and for civil security;
- Copernicus consists of an in-situ, a space and a services component, where ESA coordinates the space component;
- Data policy: free and open access → <https://scihub.copernicus.eu/>

S-1



Radar

A

3 Apr. 2014

B

25 Apr. 2016

C

2022/23

D

> 2022/23

S-2



High Resolution Optical

A

23 Jun. 2015

B

6 Mar. 2017

C

2022/23

D

> 2022/23

S-3



Medium Resolution Optical & Altimetry

A

16 Feb. 2016

B

25 Apr. 2018

C

2023

D

> 2023

S-4



Atmospheric Chemistry (GEO)

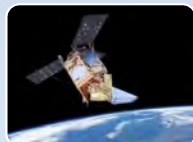
A

2021

B

2027

S-5P



Atmospheric Chemistry (LEO)

A

13 Oct. 2017

S-5



Atmospheric Chemistry (LEO)

A

2021

B

2027

C

> 2027

S-6



Altimetry

A

2020

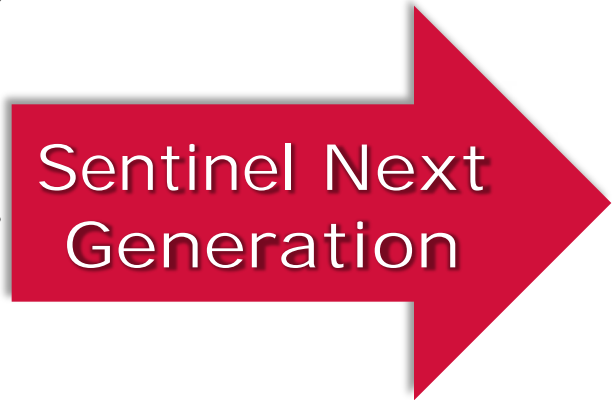
B

2025

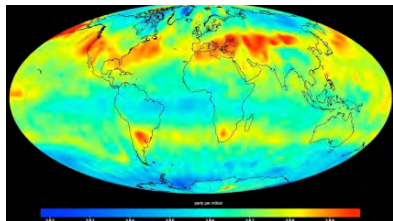
2014



Next-Gen. missions will replace current & expansion missions



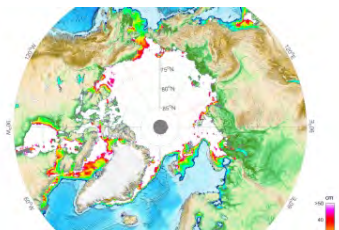
High Priority Candidate Missions



Anthropogenic CO₂
(CO2M)



Polar Ice &
Snow Topography
(CRISTAL)



Passive Microwave
Imaging (CIMR)

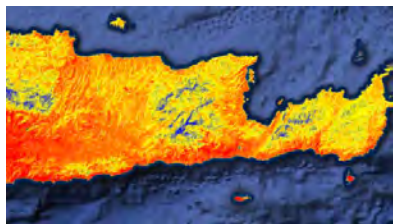
Applications

Climate Change
(Causes)

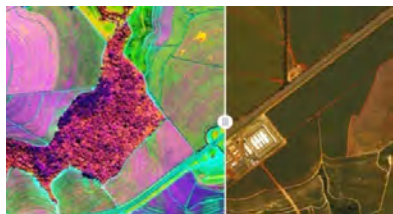
Climate Change
(Effects)

Sea Surface Temperature &
Sea Ice Concentration

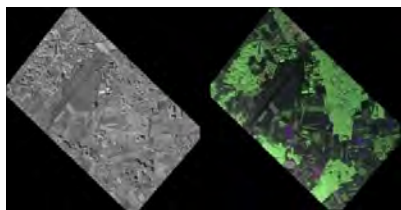
High Priority Candidate Missions



High Resolution
Land Surface
Temperature (LSTM)



HyperSpectral
Mission
(CHIME)



L-band SAR
(ROSE-L)

Applications

Agriculture & Urban
Management Services

Agricultural Management &
Food Security, Soil &
Mineral Resources

Soil, Vegetation, Food
Security & Ground Motion



CLIMATE CHANGE



MARINE MONITORING



ATMOSPHERE MONITORING



LAND MONITORING



SECURITY



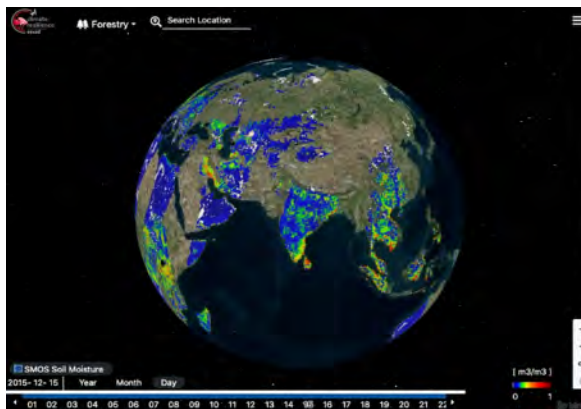
EMERGENCY MANAGEMENT

Provision of EO-based Global Climate Indicators

- Essential climate variables (albedo, LST, soil moisture, sea-level rise, precipitation, snow cover, etc.)
- Seasonal forecast and climate projections
- Vegetation indexes, water quality indexes, etc.
- Meteorological reanalysis
- ...



Earth Observation



Provision of EO-based Customized Climate Information Solutions

- Hot spot identification (flash floods, coastal flooding, soil erosion, salinity intrusion, wildfire risk, etc.)
- Monitoring of extreme events (droughts, heatwaves, floods, etc.)
- Monitoring of slow-onset events (desertification, glacial retreat, land degradation, biodiversity loss, etc.)
- ...

Climate Change Initiative (CCI+)



climate change initiative

Oceanic

Terrestrial

Atmospheric

ESA UNCLASSIFIED – For Official Use



European Space Agency



Climate
Change

Copernicus Climate Change Services (C3S)

C3S mission is to support European adaptation and mitigation policies by:

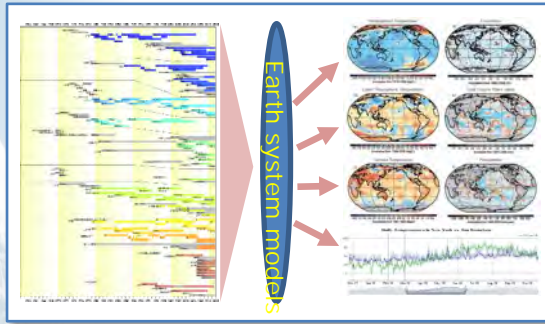
- Providing consistent and authoritative information about climate (past, present, future)
- Building on existing capabilities and infrastructures (nationally, in Europe and worldwide)
- Stimulating the market for climate services in Europe



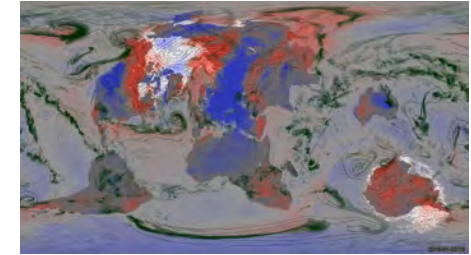


Climate Change

C3S: ACCESS TO PAST, PRESENT AND FUTURE CLIMATE INFORMATION

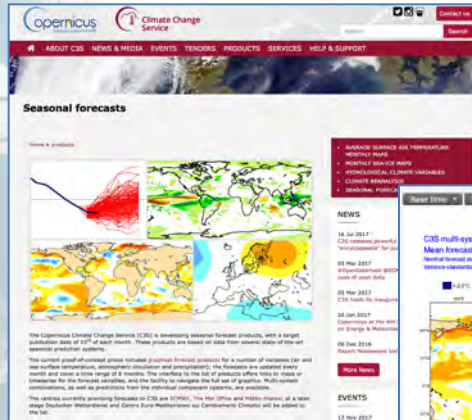


Observations, climate data records and climate Reanalyses

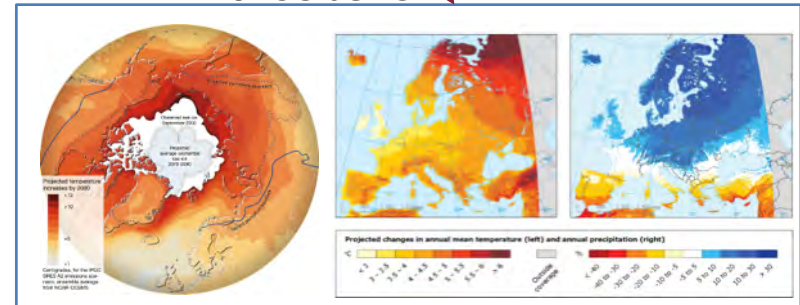
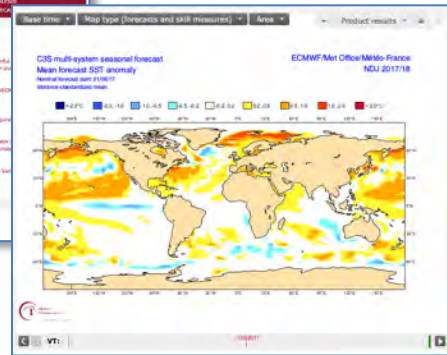


Courtesy: Philip Brohan

Seasonal forecast data and products



Climate model simulations
Sectoral climate impact indicators



<http://climate.copernicus.eu>



Summary



- The European COPERNICUS Programme will secure continuity of observations and data availability for the next decades;
- Copernicus Data policy: free and open access for everybody
→ <https://scihub.copernicus.eu/> with growing user community on the Copernicus Open Access Hub and other distribution channels and platforms
- On-going preparation on extension of the Sentinel family
- The European COPERNICUS Programme continues to support expanding the use of Sentinel data for climate science, mitigation and adaptation and support Green Economy.



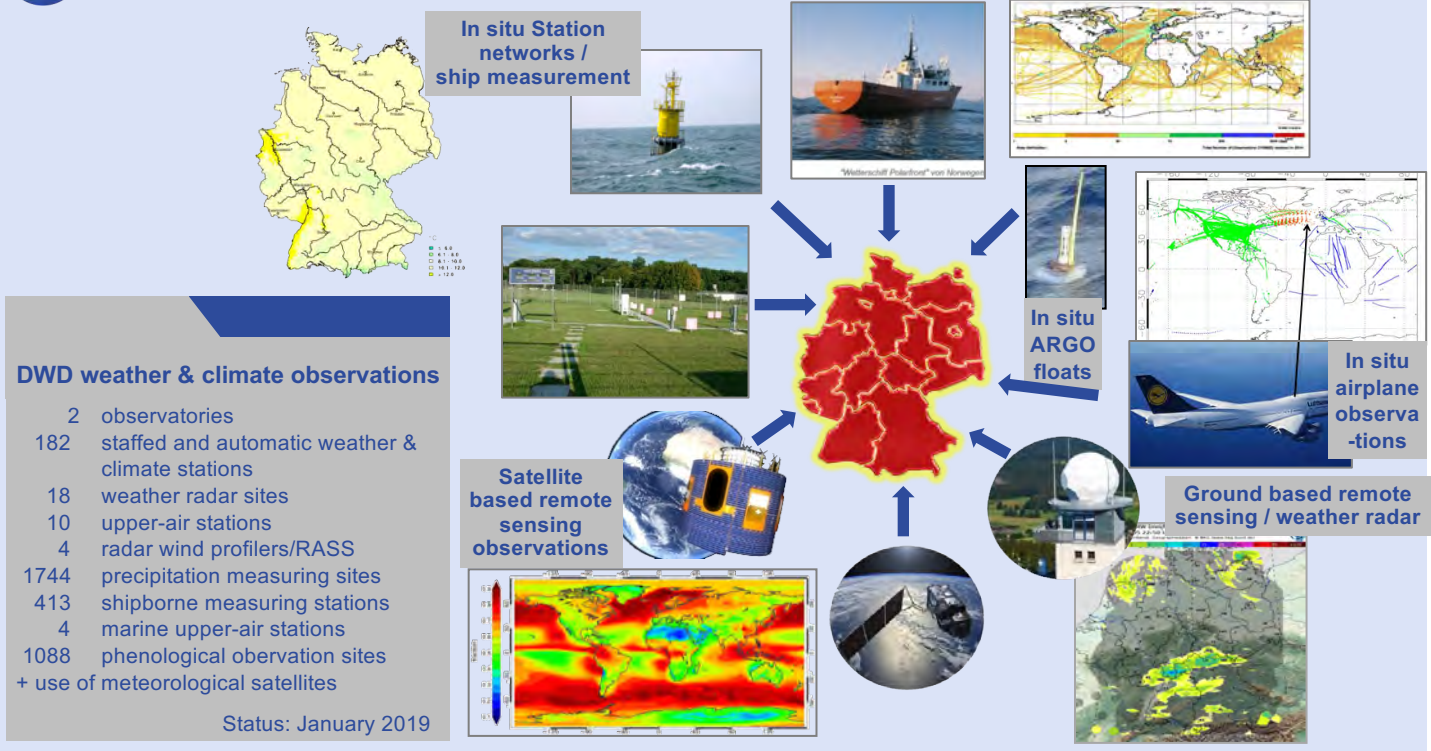


EO contribution to German climate information services in support of climate adaptation

COP25 Side Event, Madrid 2019

Stefan Rösner
Deutscher Wetterdienst, Germany

EO Platforms for climate services in Germany



- DWD weather & climate observations**
- 2 observatories
 - 182 staffed and automatic weather & climate stations
 - 18 weather radar sites
 - 10 upper-air stations
 - 4 radar wind profilers/RASS
 - 1744 precipitation measuring sites
 - 413 shipborne measuring stations
 - 4 marine upper-air stations
 - 1088 phenological observation sites
 - + use of meteorological satellites
- Status: January 2019



➔ German Strategy for Adaption to Climate Change (DAS)

- Climate monitoring + vulnerability assessment of climate change impact
- Implementation by public authorities on federal state and municipal level for 14 fields of action:
 - Water management
 - Health
 -
- Adjustment in 2015
- Next adjustment in 2021



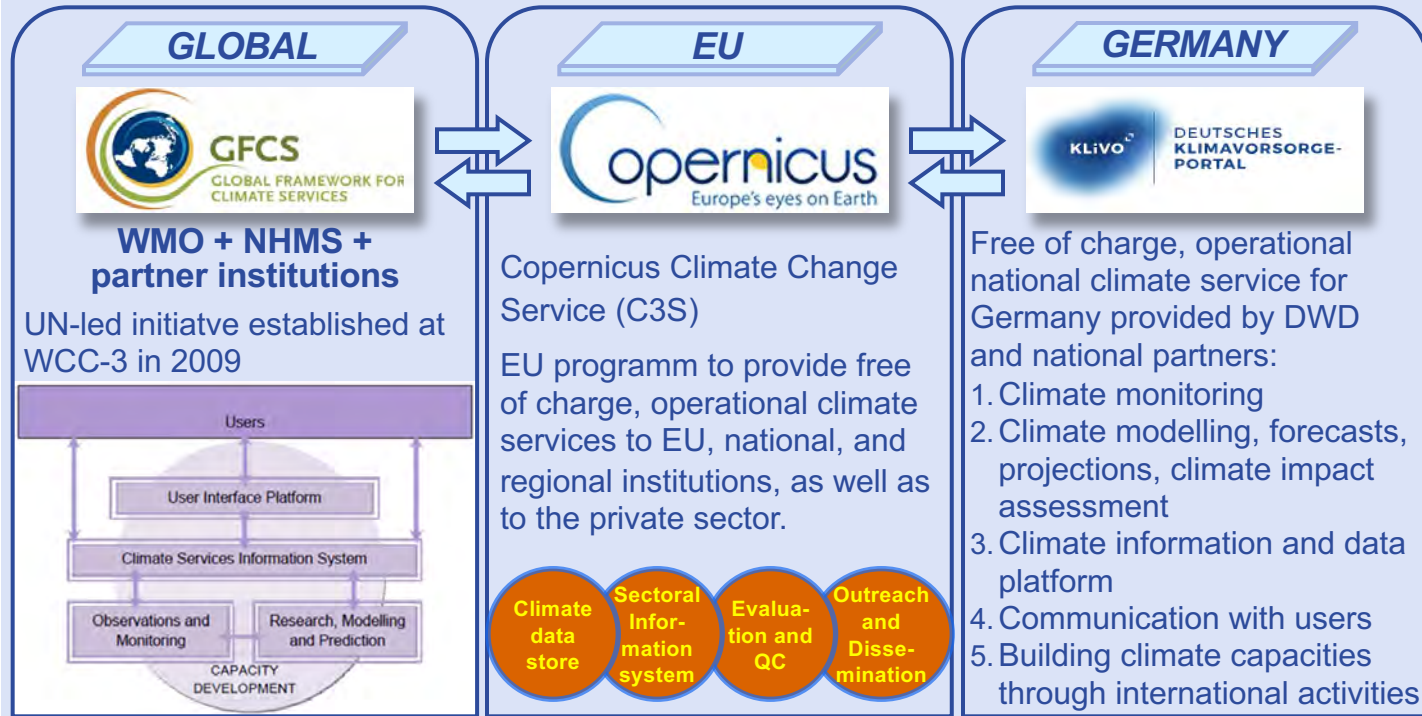
approved by
the German
government on
17.12.2008



Climate Services Global - Europe - DE

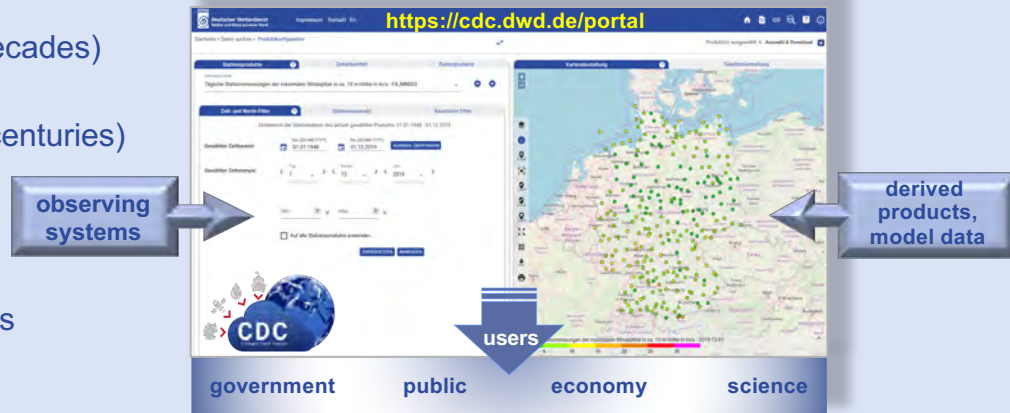
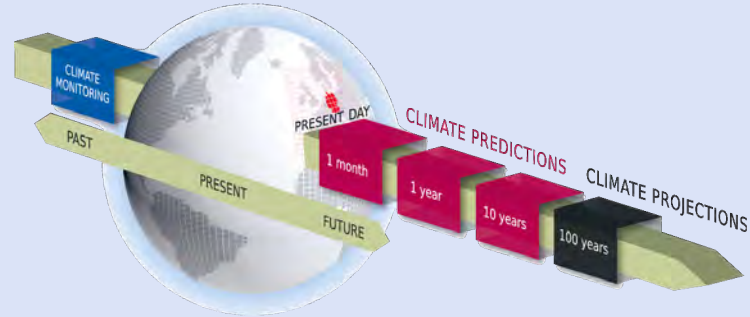


Services: *Global* > GFCS | *EU* > Copernicus | *DE* > Deutsches Klimavorsorge Portal

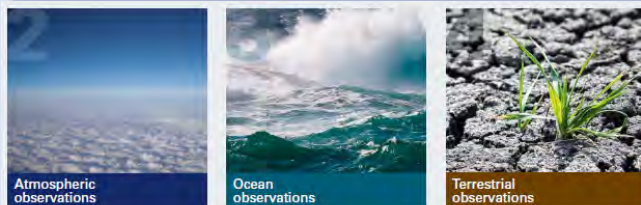


➔ Backbone components of climate services at DWD

- **Climate monitoring (based on EO)**
 - Long time series
 - Monthly seasonal and annual monitoring products
- **Climate forecasts and projections**
 - Climate forecasts (months up to decades)
 - Climate projections (decades up to centuries)
 - Impact assessments
- **Climate Data Centre**
 - Open access to DWD's climate data



Climate monitoring - ECVs observed in Germany

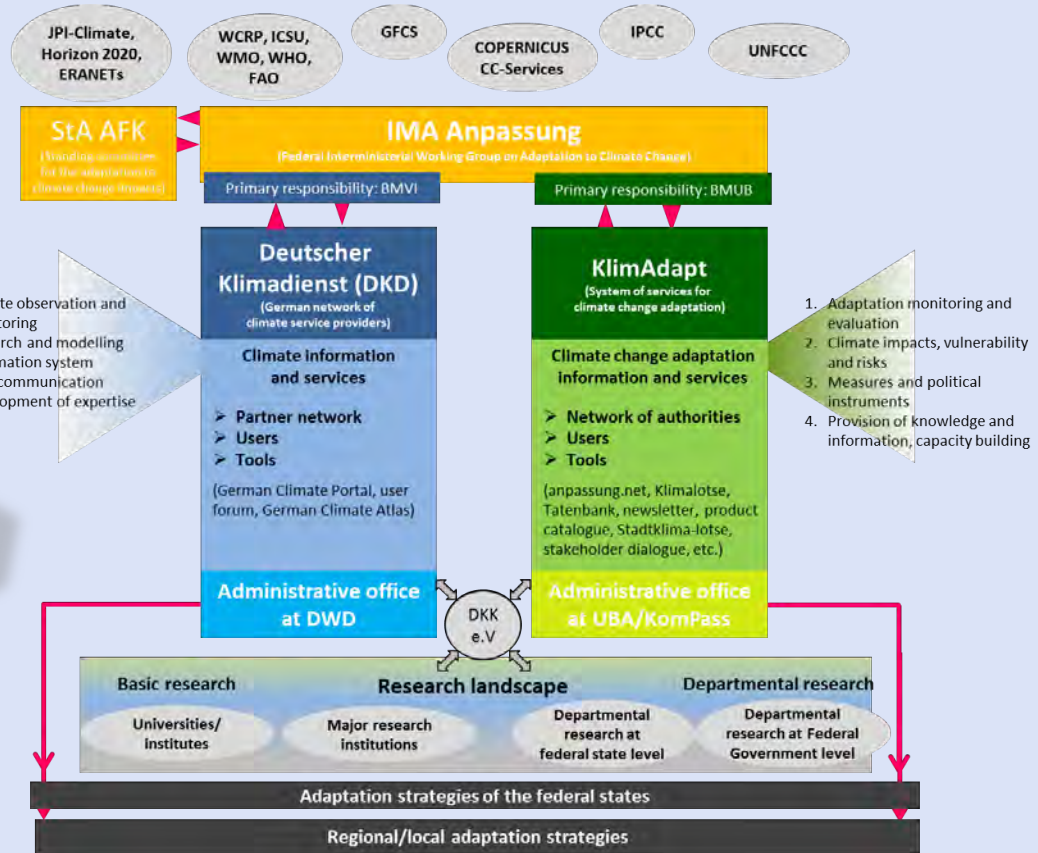


Near surface		Sea surface		Hydrosphere	
2.1 Temperature	14	3.1 Ocean temperature	44	4.1 Runoff	62
2.2 Wind	16	3.2 Salinity	46	4.2 Water use	64
2.3 Air pressure	18	3.3 Sea level	48	4.3 Groundwater	66
2.4 Precipitation	20	3.4 Sea state	50	4.4 Stable isotopes in precipitation	68
2.5 Radiation	24	3.5 Sea ice	52		
2.6 Sunshine duration	26				
Free atmosphere		Open ocean		Cryosphere	
2.7 Temperature, wind and water vapour	28	3.6 Deep water formation	54	4.5 Snow cover	70
2.8 Clouds	30			4.6 Glaciers and permafrost	72
Atmosphere composition		Ocean composition		Biosphere	
2.9 Carbon dioxide	32	3.7 Ocean colour	56	4.7 Albedo	74
2.10 Methane	34	3.8 Nutrients in the ocean	58	4.8 Soil carbon	76
2.11 Other greenhouse gases	36	3.9 Oxygen conditions in the North Sea	60	4.9 Forest fires	78
2.12 Ozone	38			4.10 Soil moisture	80
2.13 Aerosols	40			4.11 Phenology	82
2.14 Pollen	42				

Along with the Essential climate variables (ECVs), defined by GCOS, there are a few additional climate variables with long records which are of significance for characterising the climate and its variability in Germany, these include pollen, isotopes in precipitation and phenological parameters.



➔ **Climate information and services**



1. Climate observation and monitoring
2. Research and modelling
3. Information system
4. User communication
5. Development of expertise

1. Adaptation monitoring and evaluation
2. Climate impacts, vulnerability and risks
3. Measures and political instruments
4. Provision of knowledge and information, capacity building

Structure of the German Climate Service (DKD) and the Service in support of Climate Adaptation (KlimAdapt)





Climate information services for different user groups (fields of action)

- ✎ **Agencies (federal government, federal provinces and municipalities)**
 - climate adaption + civil protection
- ✎ **Forest management**
 - e.g. forest fires + storms
- ✎ **Agriculture**
 - e.g. drought
- ✎ **Health**
 - e.g. heat, UV
- ✎ **Energy and building sector**
 - e.g. low water levels, cooling water, heat
- ✎ **Water management**
 - e.g. high / low water levels
- ✎ **Transport**
 - e.g. floodings + blow up + storms



➔ Elements of German contributions to GEOSS

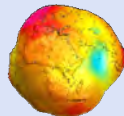
D-GEO 



GRACE



ARGO



Infrastructure for Earth Observation

- Operations of national and international networks
- National Earth Observation Programme (Space)
- Contributions to European programmes, e.g.: Copernicus, Research Infrastructures (ICOS etc.), ESA, EUMETSAT
- Contributions to international organizations and programmes, e.g.: ARGO, WMO, CEOS

Research and Development Programmes

Cooperation for Economic Development

Germany in GEO – GEO in Germany

Germany supports GEO and its objectives:

- Manifold technical/scientific contributions and data
- Contribution to GEO Secretariat (Trust Fund etc.)
- Contributions to GEO Initiatives and Working Groups
- National implementation plans since 2006

National implementation by Ministry of Transport:

- D-GEO is national coordination structure
- National implementation plan - annual work plans
- links to long standing interministerial body for geo-information (IMAGI)
- D-GEO Secretariat at DLR



 Thank you very much for your attention!



PANEL 2 - Mainstreaming adaptation

Moderator: Peter Boswell, EFCA

Meeting today's systemic and built environment challenges today

Meeting today's systemic and built environment challenges today



Mainstreaming the implementation of nature-based solutions

Sandeep Sengupta



Developing guidance and tools for adaptation planning

Jeshika Ramchand

ISO 14067 - a powerful tool for the carbon footprint of a product

Carbon Footprint Italy - carbon management according to ISO standards



Daniele Pernigotti (programme operator)

Carbon Footprint Programme operator's experience

Laura Mora, Ministry of Environment and Energy, Costa Rica



Reducing the carbon footprint of a product in accordance with ISO 14067

Sara Panigone



Meeting today's systemic and built environment challenges today

NbS TYPE 1 (landscape scale)

- no or minimal intervention in ecosystems
- better use of protected/natural ecosystems

Protected forests

Maintained wetlands

Protected intertidal zones

NbS TYPE 2 (urban scale)

- multifunctional
- extensive managed ecosystems

Ecological networks

Green corridors and belts

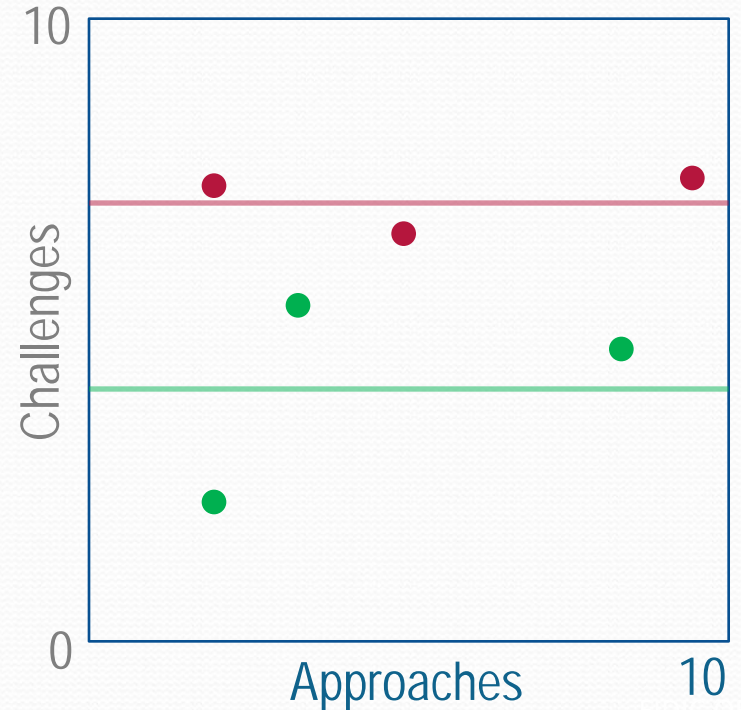
Cultural/heritage sites



thinknature

NATURE-BASED SOLUTIONS HANDBOOK

- Climate Mitigation/adaptation
- Water management
- Resilience
- Green space management
- Air quality
- Urban regeneration
- Participatory planning
- Social cohesion
- Public health
- Economic opportunities



PANEL 2 - Mainstreaming adaptation

Meeting today's systemic and built environment challenges today

Developing guidance and tools for adaptation planning

- Impacts of climate change on infrastructure - Built Environment
- Inter and Intra-dependence of infrastructure types
- Connection between NBS and the Built Environment
- Territorial Aspects – Rural-Urban Continuum
- Project Typologies
- Guidelines and Toolkits for Adaptation



International Federation of Consulting Engineers
The Global Voice of Consulting Engineers

PANEL 2 - Mainstreaming adaptation

Meeting today's systemic and built environment challenges today

Developing guidance and tools for adaptation planning

- Design Thresholds for present and future climatic conditions:
 - Constructing new infrastructure
 - Retrofitting existing infrastructure
- Financing adaptation and climate resilience
- Procurement – linking back to NDC's, government, private sector



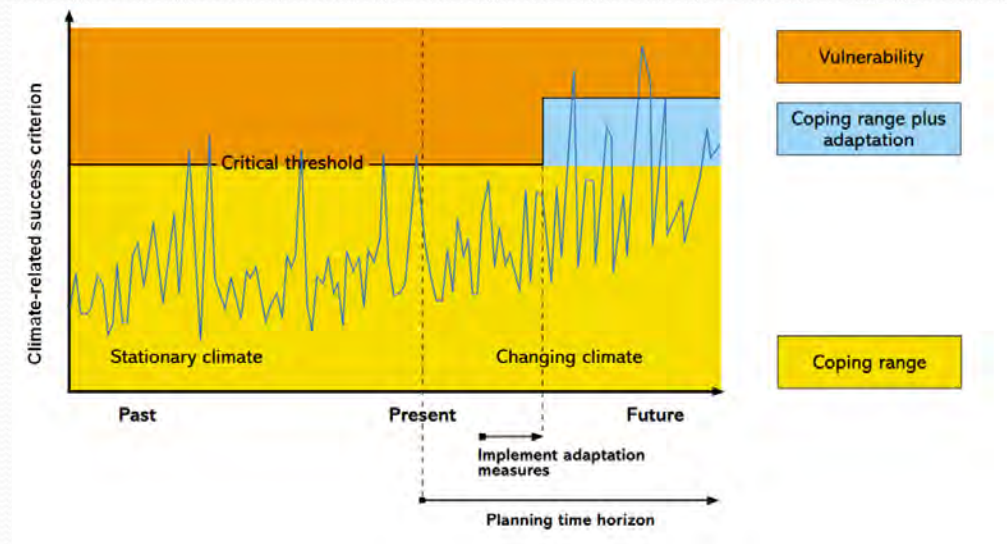
International Federation of Consulting Engineers
The Global Voice of Consulting Engineers

PANEL 2 - Mainstreaming adaptation

Meeting today's systemic and built environment challenges today

Developing guidance and tools for adaptation planning

- Policy
 - Technical Standards
 - Design & Construction Guidelines
 - Material and Process selection



[Source: Willows and Connell (2003) modified]



Carbon Footprint Italy

Daniele Pernigotti, Director

COP25, Madrid
4th December 2019



Introduction of the speaker

- **Director of Carbon Footprint Italy**
- **Convenor of ISO/TC 207/SC7/WG 8 – Development of ISO 14067 (Carbon Footprint of products) and of ISO/TC 207 Ad Hoc Group on Circular Economy**
- **Convenor of the UNI Working Group on climate change**
- **Technical advisor on GHG for Accredia; Lead Assessor or Technical Expert for Accredia, ANSI (USA) and RvA (Dutch) and EA Peer evaluator**

Carbon footprint of a product – CFP

Sum of **greenhouse gas emissions and removals**, expressed as **CO₂ equivalents** and based on a **life cycle assessment** using the single **impact category of climate change**.



The **ISO 14067:2018** has been **published on 20th August 2018**.

ISO 14067:2018

The new ISO standard is focused on **CFP quantification only**.

The **communication** is now managed, according to **ISO 14026**, by **programme operators**.



Some key points of the new ISO 14067

➤ **CFP Systematic Approach**

Set of procedures to facilitate the quantification of the CFP for two or more products of the same organisation.



➤ **CFP performance tracking**

A methodology able to show to the market the CFP reduction due to mitigation actions.





Programme operators

A programme operator is fundamental for a **transparent** and **reliable communication** to the public.

Here some **example** of program operators **established** since **2008**.





Carbon Footprint Italy

Carbon Footprint Italy is the new programme operator that has been established in Italy.



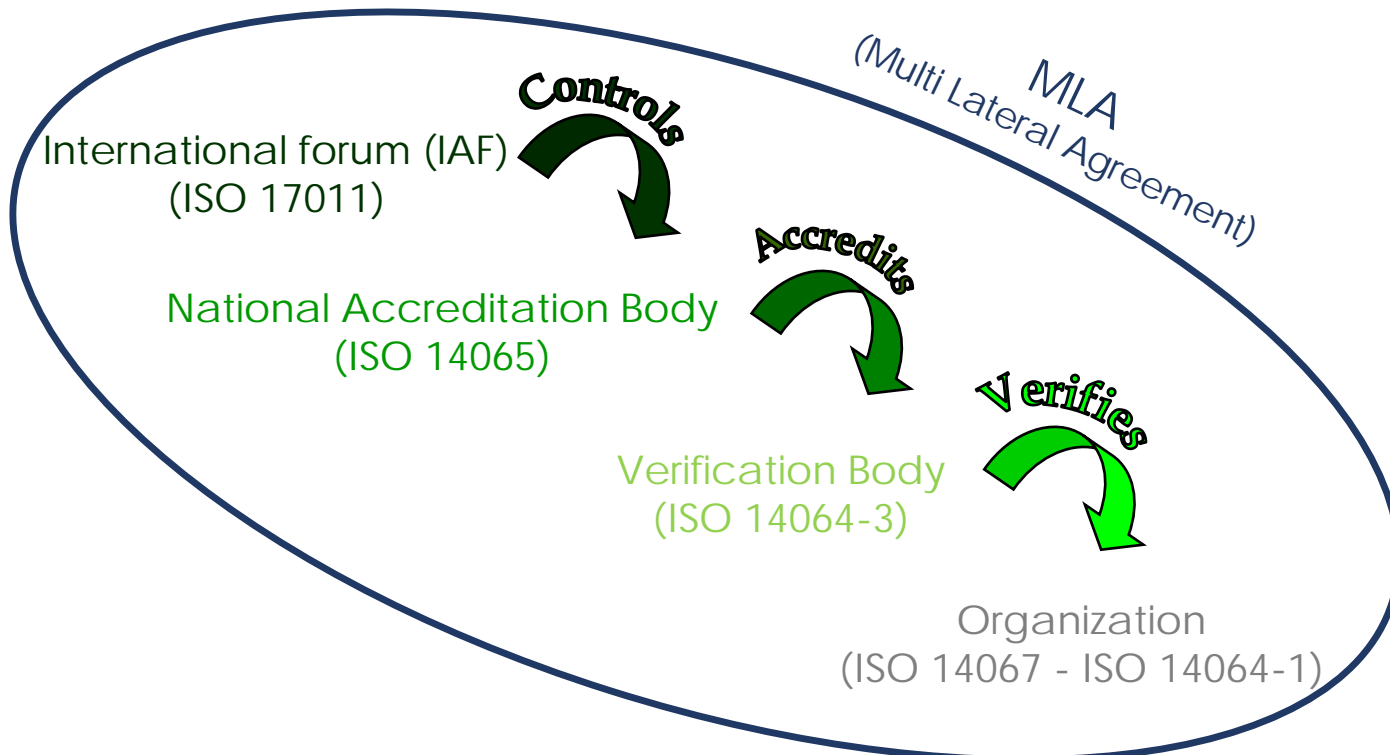


Rules

To participate it is necessary to achieve a **verification statement**, issued by an accredited verification body, related to a **product** (according to **ISO 14067**) or to an **organisation** (according to **ISO 14064-1**).



ISO: international guarantee system





Communication

Two different versions of the “CFP” mark are provided: with or without the value of verified emissions



...combined with **website link** or **QR code**

<http://www.carbonfootprintitaly.it/en/p-2019-0001-8/>



Registration n. P-2019-0008

You are here: [Home](#) / [Product](#) / [Registration n. P-2019-0008](#)

BECLOMETASONE/FORMOTEROL 100/6 MICROGRAMS PRESSURISED INHALATION SOLUTION 120 ACTUATIONS

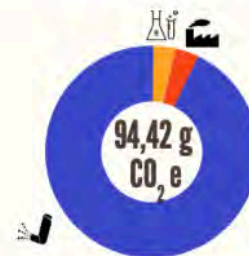



Chiesi Farmaceutici SpA



Beclometasone/Formoterol 100/6 micrograms pressurised inhalation solution 120 actuations, by Chiesi Farmaceutici.

Registration of:	28/11/2019
D.U.	1 release/puff
CFP (g CO ₂ e/d.u):	94,42
Reference year:	2017
System boundaries:	from cradle to gate
Modules excluded:	none



Upstream (3,37%) Core (3,81%) Downstream (92,82%)



Carbon reduction

There is also the “**Carbon Reduction – Mitigation product**” mark addressed to products that prove the **reduction of CO₂ emissions** due to the development of **mitigation actions** in accordance with internationally recognised standards for the specific activity.





Thank you for
the attention!



Daniele Pernigotti



direzione@carbonfootprintitaly.it

Costa Rica's Carbon Footprint Program Operator Experience

Laura Mora Mora

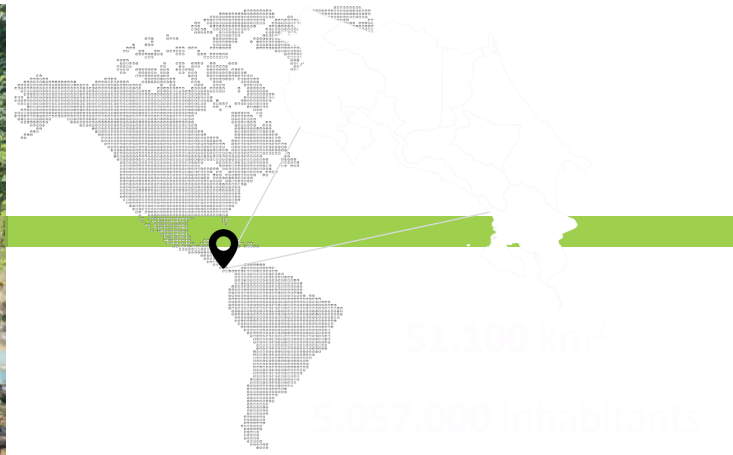
Carbon Neutrality Program Coordinator and

Technical Advisor of Costa Rica's PMR team and Climate Change Directorate

December, 2019



Costa Rica



+52%
forest cover



6,5%
World's
Biodiversity



98%
Renewable
energy



11 million
tCO₂e
Inventory (2012)



2,4 tCO₂e
per capita emissions



Zero net-
emissions
decarbonization goal
(2050)



What are we doing
about CFP in the
region?



Environmental Seal of the Americas

Source: Rodriguez, L - 2019, MINAE

- In 2015, German international cooperation was achieved to **promote the environmental labeling in America.**
- **Mexico, Costa Rica and Colombia** initially joined this initiative. Later **Ecuador** was included.
- Type I environmental labeling (seal) **is designed.**
- Type III labeling **design is in process**
- The **homologation process** of environmental labeling standards began.
- In 2019, the **Environmental Alliance of the Americas was established** and it will manage the environmental labeling program in the region
- Environmental labeling in the region will require accreditation, as a guarantee of reliability.
- A knowledge exchange was carried out with other global environmental labels: European Flower, Nordic Swan, Blue Angel of Germany and the Global Ecolabeling Network.



What are we doing
in Costa Rica?

National Policy of Sustainable Public Procurement (2015)

It's based on the following key aspects:

Promotion of **modern production models**, development of innovation, **responsible and scientifically valid communication** about products and services, **considering the complete products life cycle...**



National Production and Sustainable Consumption Policy



What have we done at the national level?



- Agreement at a National level (NATIONAL ENVIRONMENTAL AND ENERGETIC LABELING PROGRAM)
- General Standard for Type I Labeling
- Specific standards for some products (cleaning products, etc.)
- General Standard for Type III Labeling
- Type I label is designed and in process of registration
- In 2017, a pilot labeling program was carried out for coffee with an environmental footprint label. The coffee was sold in an international auction and **was overpriced by 46%** thanks to the new label.

Green coffee for export of Costa Rica

First LCA
(scan type)

First product
category rule
in the country

REGLA DE CATEGORÍA DE PRODUCTO PARA ELABORAR ANÁLISIS DE CICLO DE VIDA DEL CAFÉ VERDE DE EXPORTACIÓN DE COSTA RICA



Julio -2019



? Under construction - an
accreditation scheme for
Water Footprint



New categories



Products and events

Including Carbon Neutrality Statements

(Under construction)





National Environmental Labeling Program of Costa Rica

DCC
Operator

SCOPE



GOODS



SERVICES
events



Type III labeling
(based on INTE/ISO 14025)

INTE B12:2014

Impact category:
Climate Change

STEPS

Measurement

1. Emissions / Removals: ISO 14067 and official PCR
2. Reductions: INTE B5
3. Offsetting: UCC, CER, VER

Report

Responsible party statement following requirements established in technical standards

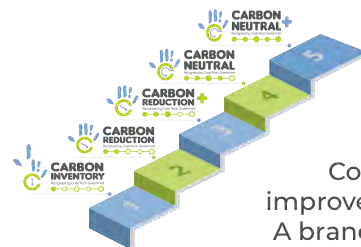
Verification

Independent and impartial third party evaluation

Frequency: every 3 years.
Critical review: applicable when there is not a published PCR

RESULT

For brand use
ISO 14026: 2017



Continuous improvement system
A brand with results information



Accreditation
ISO 17029 /
ISO 14065

Next steps

Capacity Building for
new VVBs (LCA)

LC studies for selected
products - medical
devices, fruits, tourist
services (pilot)

4 tools to apply LCA to
selected products

Initial Database with
collected information

PCR for events

Official launch of the
new categories

Incentives:

Sustainable
procurement

Brand recognition and
communication
strategy

Climate financing

Why is the Costa Rica model moving forward?



- Enabling conditions allow private and public sector to take actions
- Policies are clear and easy to understand
- All initiatives are scalable to promote country-wide efforts
- Designing and developing practical and recognized programs (tools) for private and public sector
- Our tools are trustworthy for the private and public sector
- Sectors should have tools to participate in climate action and sustainability, to achieve mass scale action.
- Our consumption model is unsustainable, this programs push sectors to transform this model faster



PARTNERSHIP FOR
MARKET READINESS
COSTA RICA

giz



DESCARBONICEMOS
COSTA RICA
COMPROMISO PAÍS 2018-2050



COSTA RICA
GOBIERNO DEL BICENTENARIO
2018 · 2022

Thank you

Laura Mora Mora
Carbon Neutrality Program Coordinator and
Technical Advisor
Costa Rica's PMR team and Climate Change Directorate
lauramora207@gmail.com / programapais.dcc@minae.go.cr



Reducing the Carbon Footprint of a product

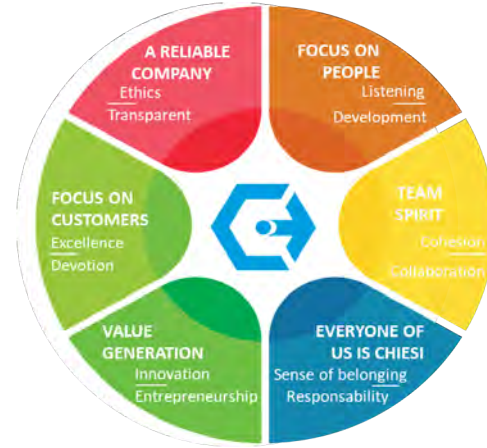
Chiesi key study, in accordance with ISO 14067

Sara Panigone – Sustainable Device Transition Leader



Chiesi Group in a snapshot

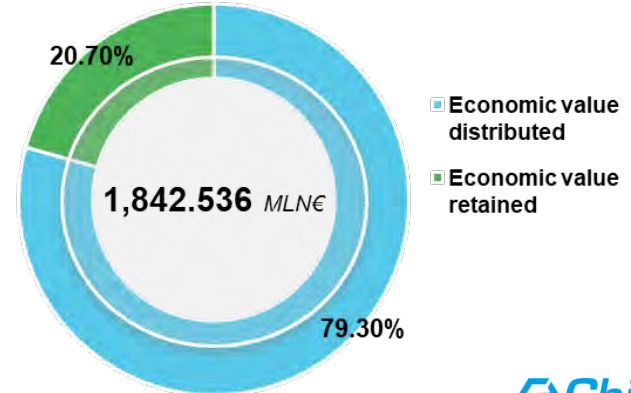
An innovative family-owned company working for the health of our world and all of its environmental, cultural, economic, and societal components.



Chiesi is the largest global pharmaceutical group to be awarded B Corp Certification



Economic value generated



Chiesi Sustainability Vision



**We
ACT** →
ACTIVELY
CARE FOR
TOMORROW

Chiesi has the capability, the resources and the skills to contribute to the SDGs, and in particular:



**On September 25th, 2019,
Chiesi set itself the challenge to become
carbon neutral by 2035**

Systematic Approach (SA): Carbon Footprint calculation

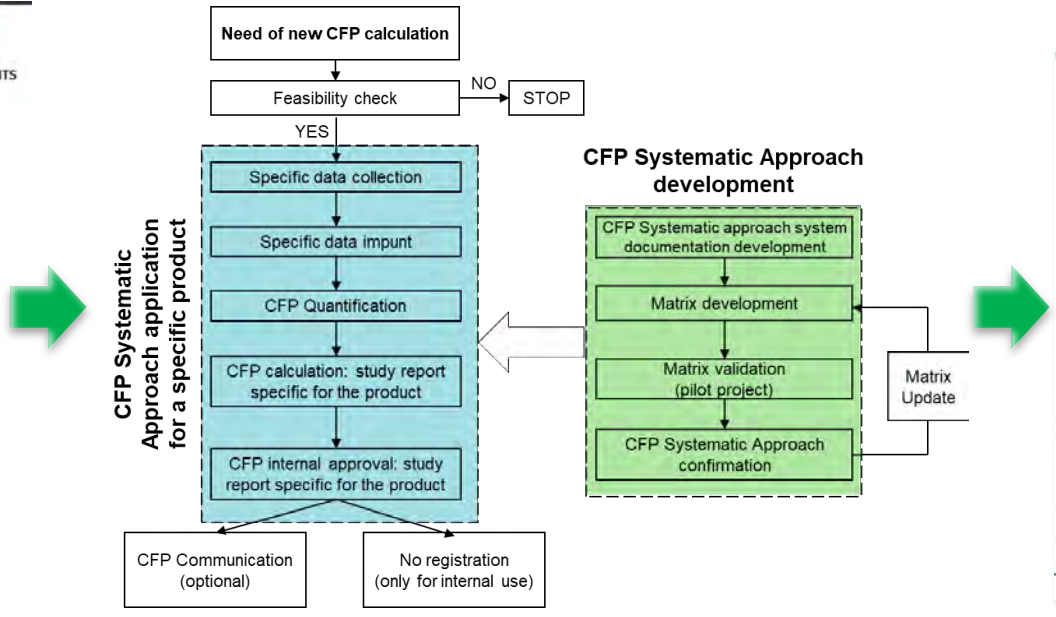


ISO
 ISO 14067:2018
 GREENHOUSE GASES — CARBON FOOTPRINT OF PRODUCTS — REQUIREMENTS AND GUIDELINES FOR QUANTIFICATION

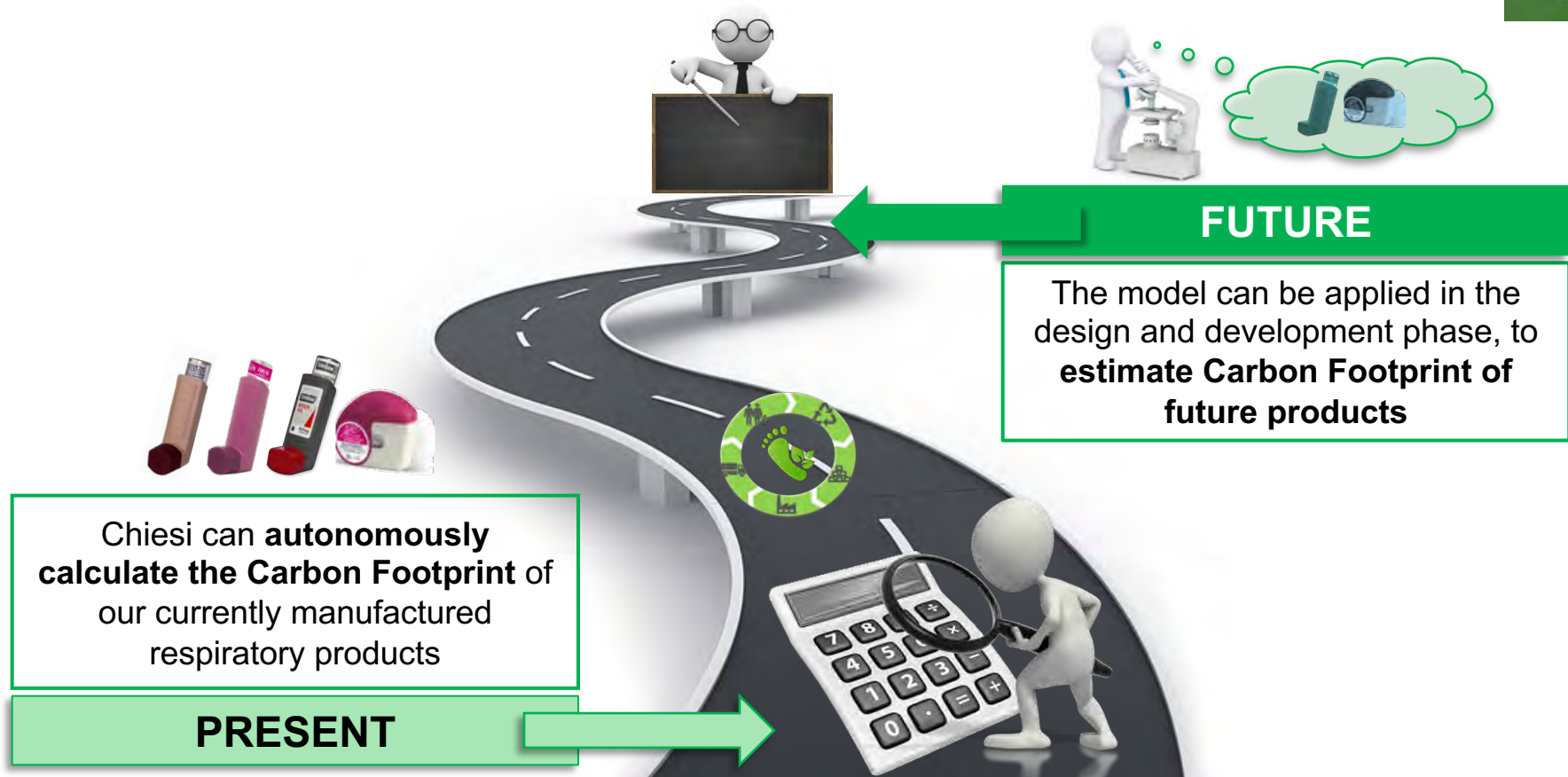


ERM Sustainable Development Unit
 Greenhouse Gas Accounting Sector Guidance for Pharmaceutical Products and Medical Devices
 GHG Protocol Product Life Cycle Accounting and Reporting Standard
 November 2012

BUILT ON GHG PROTOCOL



Why using a Systematic Approach?



Certified Carbon Footprint of current products

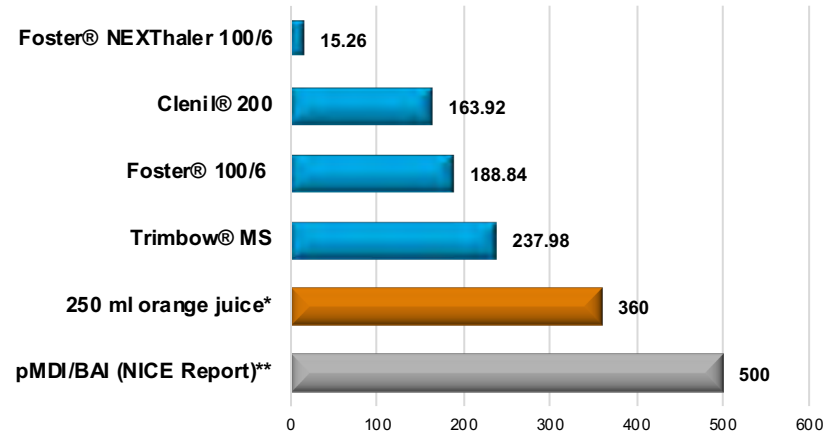


Respiratory devices and treatment methods	Carbon Footprint per actuation (g CO ₂ e)
CFC MDI*	750 – 1000
HFA-227ea MDI*	300 – 400
HFA-134a MDI*	100 – 150
Trimbow® (beclometasone dipropionate/formoterol /glycopyrronium) MS HFA-134a MDI	118.99
Foster® (beclometasone dipropionate/formoterol) 100/6 HFA-134a MDI	94.42
Clenil® (beclometasone dipropionate) 200 HFA-134a MDI	81.96
Foster® NEXThaler (beclometasone dipropionate/formoterol) 100/6 DPI	7.63



Chiesi

Carbon Footprint g CO₂q/dose (2 actuations)



* Data from MCTOC 2018 Assessment Report

** Data from NICE Patent Decision Aid 2019

Clenil® (beclometasone dipropionate, pMDI)

Foster® (extrafine beclometasone/formoterol, pMDI)

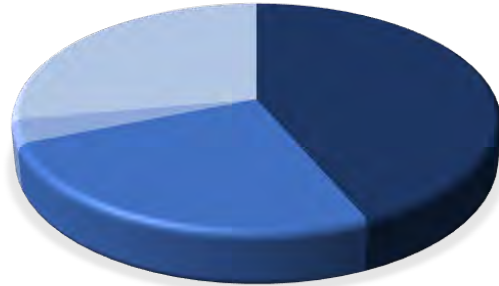
Foster NEXThaler® (extrafine beclometasone/formoterol, DPI)

Trimbow® (extrafine beclometasone/formoterol/glycopyrronium, pMDI)

Apply the SA in perspective



UPSTREAM 3.16%



- Raw materials - drug (43.54%)
- Raw materials - device (25.31%)
- Raw materials - packaging (3.27%)
- Propellant gas (27.88%)
- Packaging device (0.00%)

CORE 3.17%



- Raw materials transportation (3.52%)
- Energy and Water (53.03%)
- Waste (1.89%)
- HFA leaks (17.23%)
- Emissions (24.34%)
- Waste water (0.00%)

DOWNSTREAM 93.66%

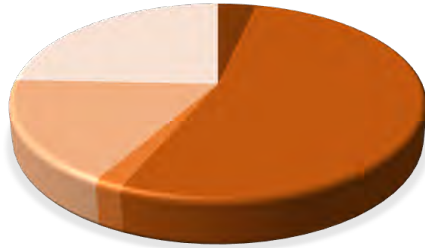


- Drug transportation (0.32%)
- Usage (75.67%)
- Waste and end of life (24.01%)

Apply the SA in perspective – CASE 1



CORE 3.17%



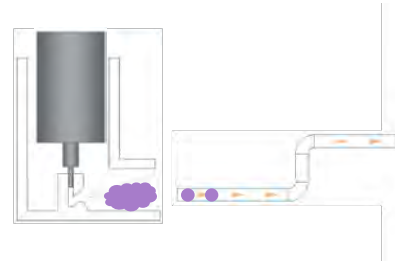
- Raw materials transportation (3.52%)
- Energy and Water (53.03%)
- Waste (1.89%)
- HFA leaks (17.23%)
- Emissions (24.34%)**
- Waste water (0.00%)

Reducing the Carbon Footprint of Chiesi pMDI products by **improving the spray test phase**

MANUFACTURING PROCESS



pMDI spray test machine:
two puffs for each can



PRESENT

4.2 tonnes/year of HFA134a released in the air

FUTURE

Prevent from releasing 4.2 tonnes/year of HFA134a in the air

Apply the SA in perspective – CASE 2

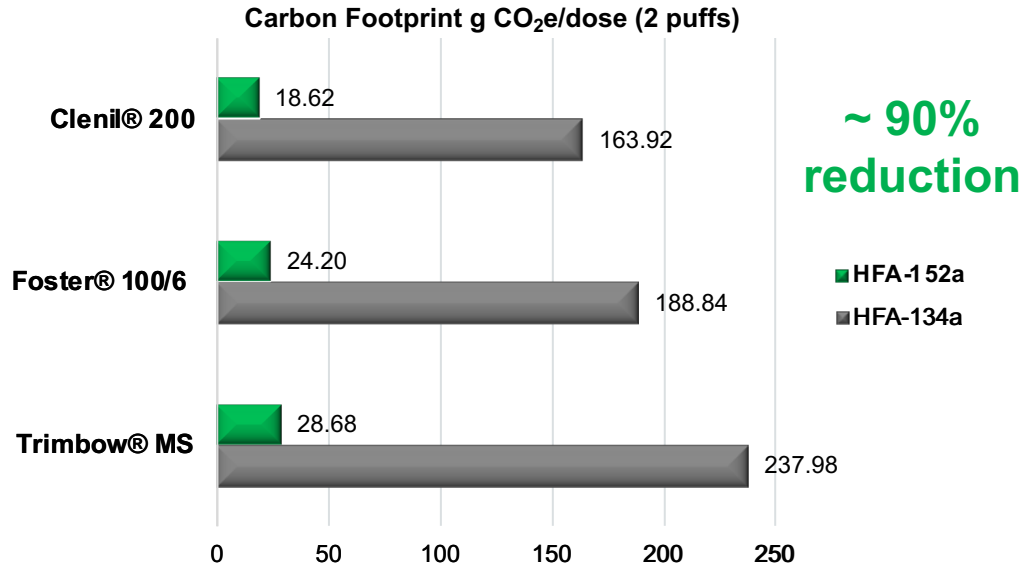
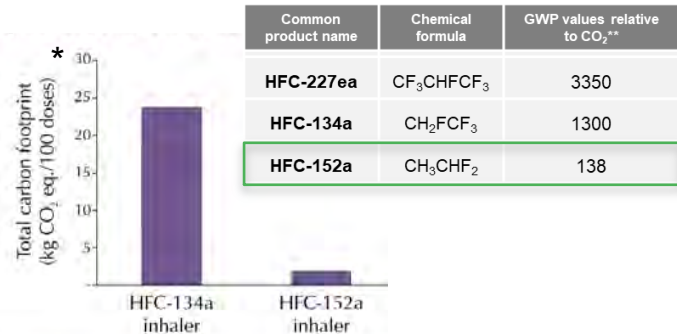


DOWNSTREAM 93.66%



- Drug transportation (0.32%)
- Usage (75.67%)
- Waste and end of life (24.01%)

Reducing the Carbon Footprint of Chiesi pMDI products by **using a low-GWP propellant***



* Data from: Jeswani et al., Reducing carbon footprints of metered dose inhalers, 2017

** Data from: IPCC Fifth Assessment Report (AR5) 2014

Conclusions: what does this mean for Chiesi?



Chiesi commitment to sustainable innovation

Chiesi is committed to actively and increasingly operate business in a way that ensures long-term sustainability, taking steps to **minimize the environmental impact of our products.**



Innovation is the way forward

Chiesi is **committed to introduce the first carbon minimal pMDI by 2025**, ensuring nearly 90% carbon footprint reduction, while continuing investing in DPI technology



Patient health shall always be at the center

Patient's health is at the heart of Chiesi current and future therapeutic solutions and we are committed in **maintaining access to the range of treatment options that patients need**

OUR WORLD,
OUR FUTURE,
OUR CHOICE!