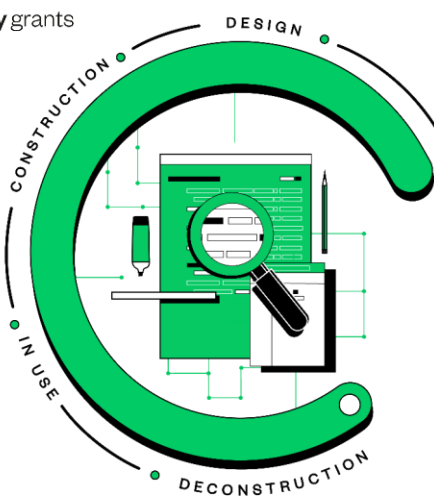


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Course:
Data Templates – Awareness

GrowingCircle
Integrated Data for an Efficient and Sustainable Construction

More information at:
<https://growingcircle.netlify.app/project/>

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Partner

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Video and exam



- **GrowingCircle project continues the awareness actions on Data Templates.**
- **This video aims to explain how Data Templates are relevant structures for the information traceability through the construction processes.**
- <https://www.youtube.com/watch?v=RnMsT4fOMk> (20:48)
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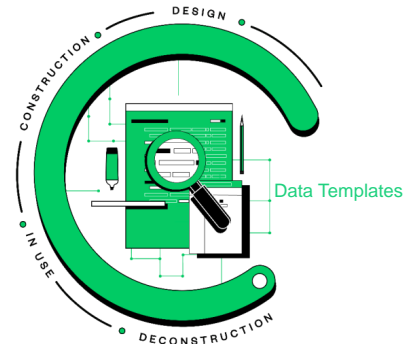
2

Learning Outcomes



To bring **awareness** of Construction Industry stakeholders (that already have a basic knowledge on BIM) for the **relevance and role** of **Data Templates** on the construction process and as tool to foster efficiency and circularity.

After this class you should have **gained competency** to identify the role of **Data Templates** plays to **Integrate Data for an Efficient and Sustainable Construction**.



3

Learning Outcomes

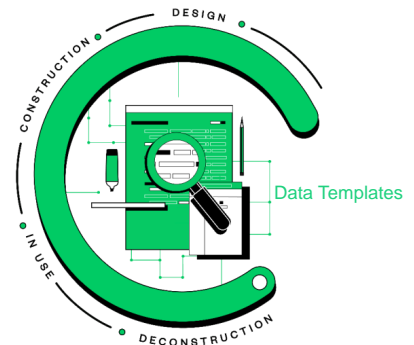


To bring **awareness** of **Construction Industry stakeholders** (that already have a basic knowledge on BIM) for the relevance and role of **Data Templates** on the construction process and as tool to foster efficiency and circularity.

After this class you should have **gained competency** to identify the role of **Data Templates** plays to **Integrate Data for an Efficient and Sustainable Construction**.

The learning objectives target:

- The Data Templates characteristics and functions
- Comprehension that Data Templates are data-driven and range Building's life cycle
- Identify the outcomes from Data Templates deployment for an efficient and more circular construction



4

To start – digital data is all around



cars.com Cars for Sale Research & Reviews News & Videos Sell Your Car Service & Repair

Make Body style **Advanced search** Shop by what matters

New/used: New cars | Make: Nissan | Model: Pathfinder

Price: No max price | Distance: 30 miles | ZIP: 60606 **Search**

Shop by what matters: From cargo space to... find you cars to love.

Body style: Car

Make: Any | Model: Any

Model variant: Any

Mileage: Any

Gearbox: Any

Min price: Any | Max price: Any

Body type:

- Hatchback (165,972)
- Estate (19,349)
- SUV (112,816)
- Saloon (29,494)
- MPV (11,402)
- Pickup (5,572)
- Coupe (21,942)
- Convertible (19,730)

Fuel type:

- Bi Fuel (324)
- Diesel Hybrid (2,019)
- Electric (6,565)
- Natural Gas (1)
- Petrol Hybrid (14,204)
- Diesel (144,527)
- Diesel Plug-in Hybrid (102)
- Hydrogen (3)
- Petrol (215,622)
- Petrol Plug-in Hybrid (5,984)



5

To start – digital data is all around



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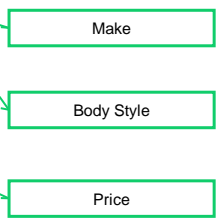
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6

To start – digital data is all around



Basics

Exterior color	White
Interior color	Charcoal
Drivetrain	Four-wheel Drive
MPG	21-27
Fuel type	Gasoline
Transmission	9-Speed Automatic
Engine	3.5L V6 24V GDI DOHC
VIN	5N1DR3BD0NC123895
Stock #	220007
Mileage	10 mi.
Vehicle history	-

Features

- These features are associated with this vehicle type. Contact the seller to confirm this specific vehicle has them.
- 000 Lbs)
 - 18 Painted Alloy Wheels
 - 1st, 2nd and 3rd row head airbags
 - 3rd Row Head Room: 37.8"
 - 3rd Row Hip Room : 48.7 "
 - 3rd Row Leg Room : 28.0 "
 - 3rd Row Seats: Bench
 - 3rd Row Shoulder Room: 58.4"
 - 4 Door
 - 4-Wheel Disc Brakes
 - 4-wheel ABS Brakes
 - 6 Speakers
 - 60-40 Third Row Seat
 - ABS Brakes
 - ABS and Driveline Traction Control
 - AM/FM Radio: Siriusxm
 - Adaptive cruise control
 - Manufacturer's 0-60mph acceler...
 - Max cargo capacity: 80 cu.ft.
 - Metal-look/piano black center co...
 - Multi-link rear suspension
 - NissanConnect
 - NissanConnect Services
 - Nissanconnect Featuring Apple C...
 - Occupant Sensing Airbag
 - Outside Temperature Display
 - Overall Length: 197.0"
 - Overall Width: 77.9"
 - Overall height: 70.9"
 - Overhead Airbag
 - Overhead Console
 - Overhead console: Mini with stor...
 - Painted aluminum rims
 - Panic Alarm

- Driver airbag
- Driver and passenger heated-cu...
- Dual Front Impact Airbags
- Dual Front Side Impact Airbags
- Dual front air conditioning zones
- Dual illuminated vanity mirrors
- Dusk sensing headlights
- Electronic Stability Control
- Emergency Communication Syst...
- Engine immobilizer
- External temperature display
- Fold forward seatback rear seats
- Four Wheel Independent Suspen...
- Four-wheel Independent Suspen...
- Front Anti-Roll Bar
- Front Beverage Holders
- Front Bucket Seats
- Front Center Armrest
- Front Dual Zone A/C
- Right rear passenger door type: ...
- Roof Rack: Rails Only
- Roof rails
- Seatback storage: 2
- Seatbelt pretensioners: Front
- Security System
- Selective service internet access
- Side airbag
- SiriusXM AM/FM/HD/Satellite Ra...
- SiriusXM Satellite Radio(TM)
- Spare Tire Mount Location: Unde...
- Speed Control
- Speed Sensitive Audio Volume C...
- Speed-Sensing Steering
- Speed-Sensitive Wipers
- Speed-proportional power steeri...
- Split Folding Rear Seat
- Split rear bench
- Spoiler
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- Split rear bench
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- Stability control



Moving to Construction Industry...



The Construction Industry uses also similar tools:

Digital product passports (DPP)

Circular Materials Passports

Material Passports

Product Circularity Data Sheets

others....



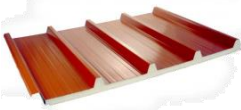
Why this is so important?




Write down your arguments:


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Liechtenstein
Norway grants


Why this is so important?



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Project **GrowingCircle**

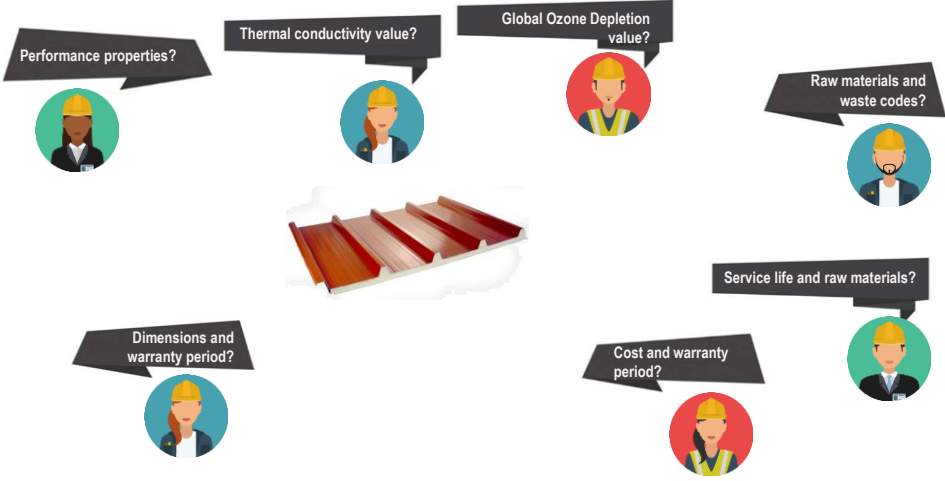
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Partner  NTNU
Norwegian University of Science and Technology


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Why this is so important?




- Performance properties?
- Thermal conductivity value?
- Global Ozone Depletion value?
- Raw materials and waste codes?
- Service life and raw materials?
- Cost and warranty period?
- Dimensions and warranty period?

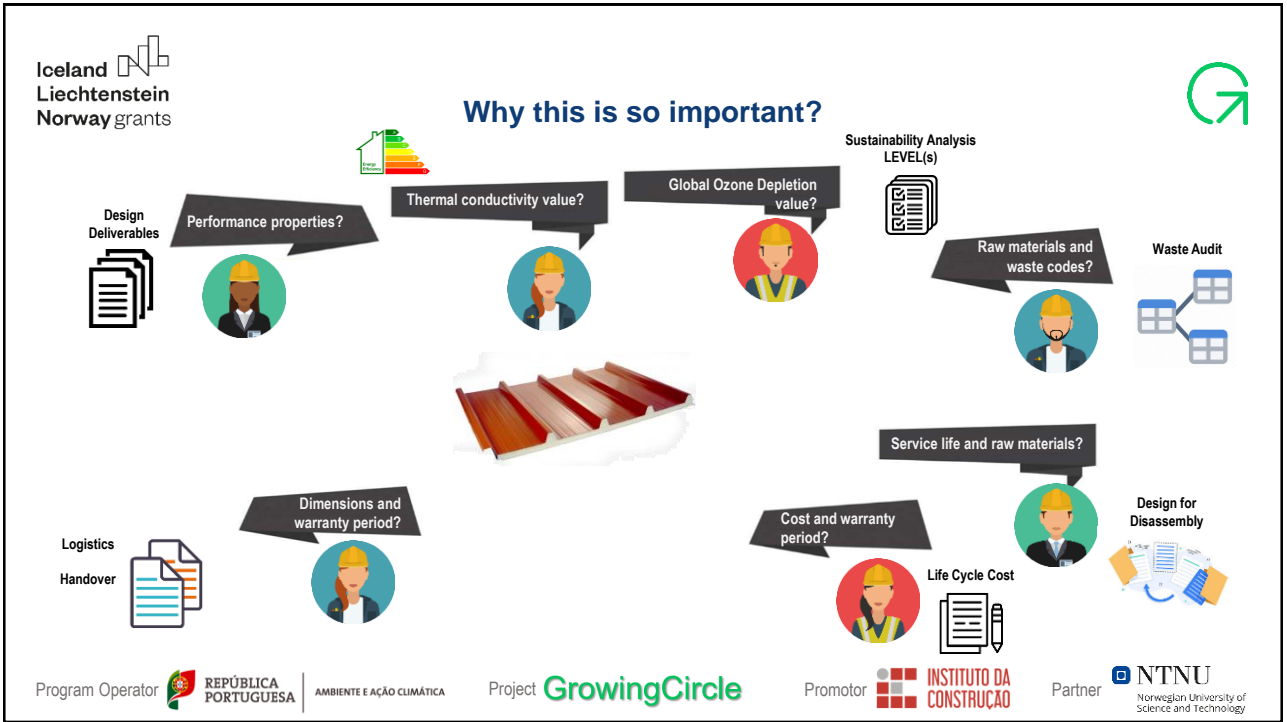
Program Operator  REPÚBLICA PORTUGUESA | AMBIENTE E AÇÃO CLIMÁTICA

Project **GrowingCircle**

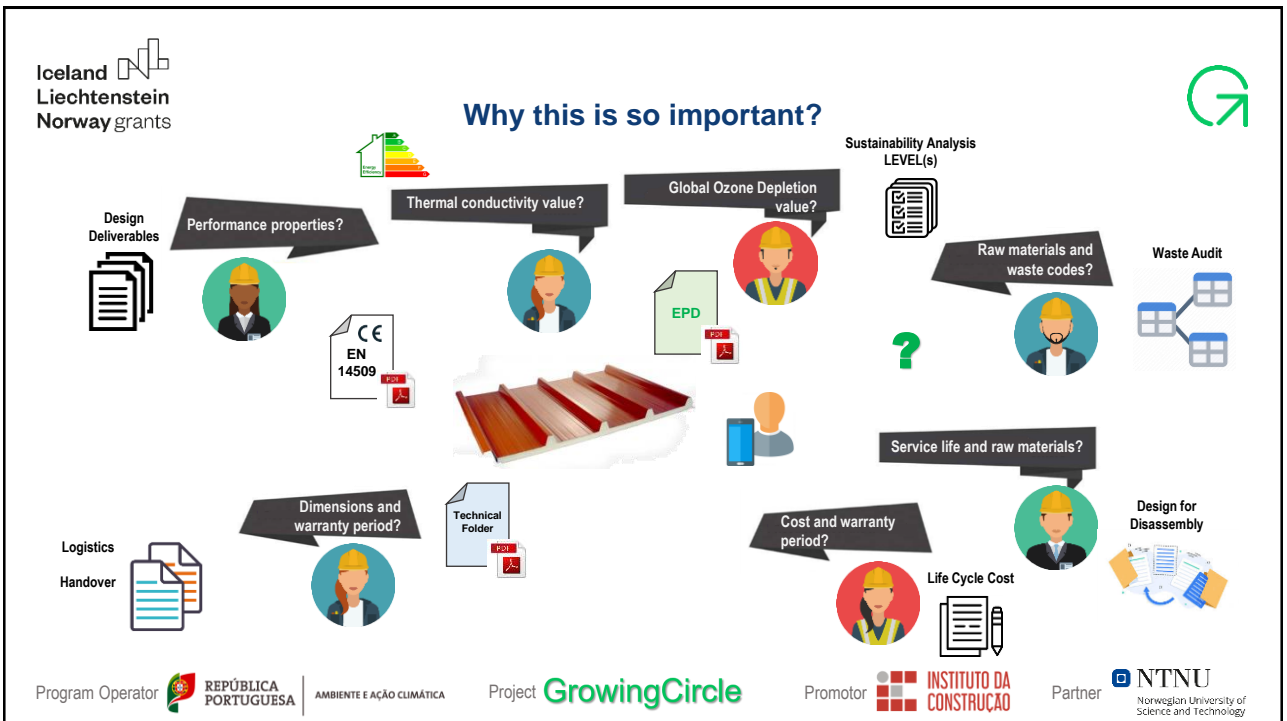
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13



14

The 'Data-Elephant' in the Construction Industry



Challenges for building materials 'supply chain' (by Paul Surin)

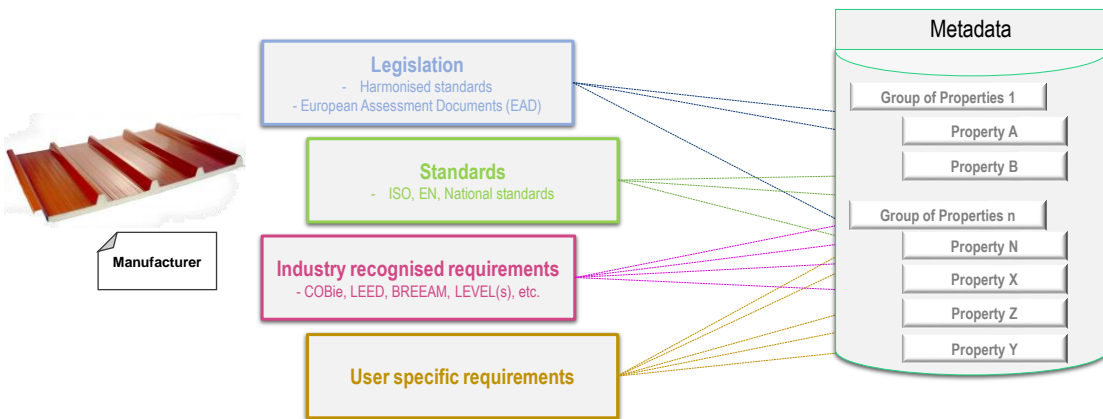
- Siloed data in inconsistent formats
- Low data quality and lack of data governance
- Over 30 classification systems – BauClass, Uniclass, NRM
- Fragmented BIM landscape with different standards (To BIM or not to BIM)
- Fragmented vendor landscape with limited interoperability Lack of standards for parts/equipment catalogues
- Lack of IT & OT security of Digital Twins and Models
- Sites lack infrastructure to leverage data
- Install base lacks sensors and embedded monitoring to benefit from IoT
- Insufficiently skilled labour to implement complex data projects



Simply investing in BIM is insufficient to address the **data challenges** faced by materials' 'supply chain'

Adapted from Paul Surin (IBM)

The solution



Concept adapted from @Cobuilder As **cobuilder**

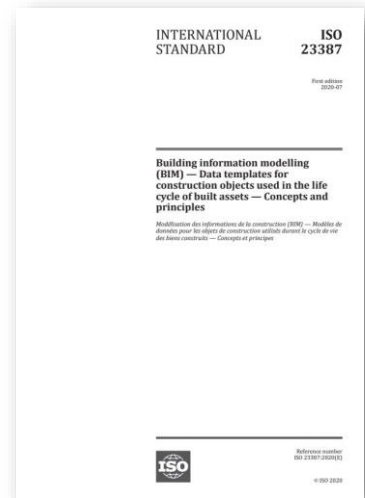
Data Templates (*are - will - have*)



Write down your answers:

Data Templates

- are:
- will:
- have:



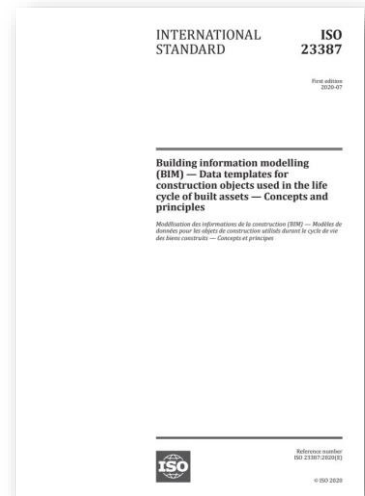
Data Templates (*are - will - have*)



Data Templates are standardised, interoperable metadata structures used to describe the characteristics of construction objects. [ISO 23387](#)

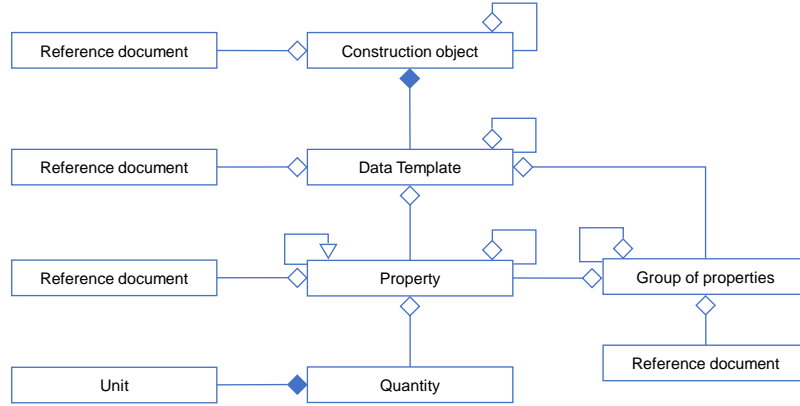
“Data templates will enable construction project stakeholders to exchange information about construction objects through an asset life cycle, using the same data structure, terminology and globally unique identifiers to enable machine-readability.” [ISO 23387](#)

“Data templates have a common data structure describing the characteristics (called ‘properties’) of a construction object, and its physical qualities, according to a credible source of information –be it a standard or regulation. On the other hand, for any software, the data template structure is a set of concepts that are connected to each other with different relationships.”
[Cobuilder](#)

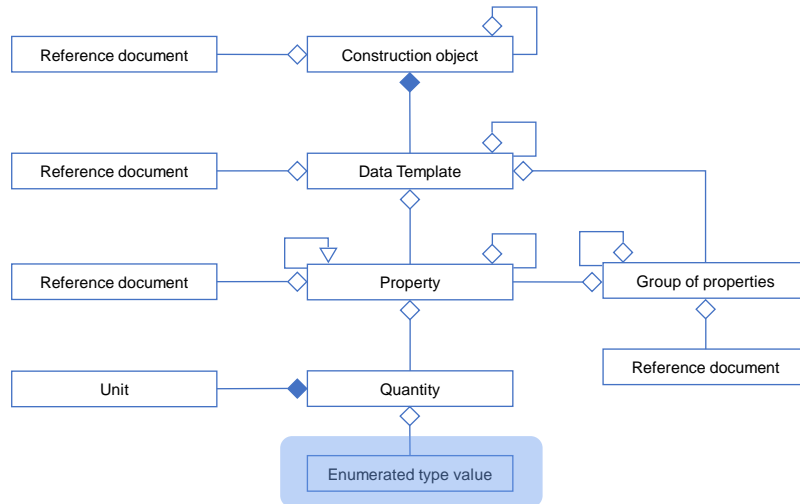




Data Templates in detail (ISO 23387)



Data Templates in detail (ISO 23387)



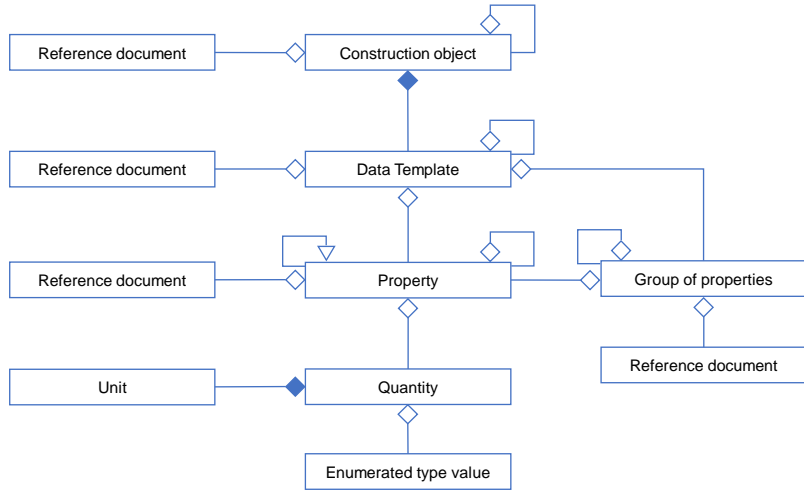
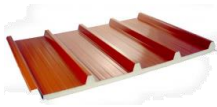
Data Sheets
(following ISO 23387)

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Data Templates in detail (ISO 23387)

Example:

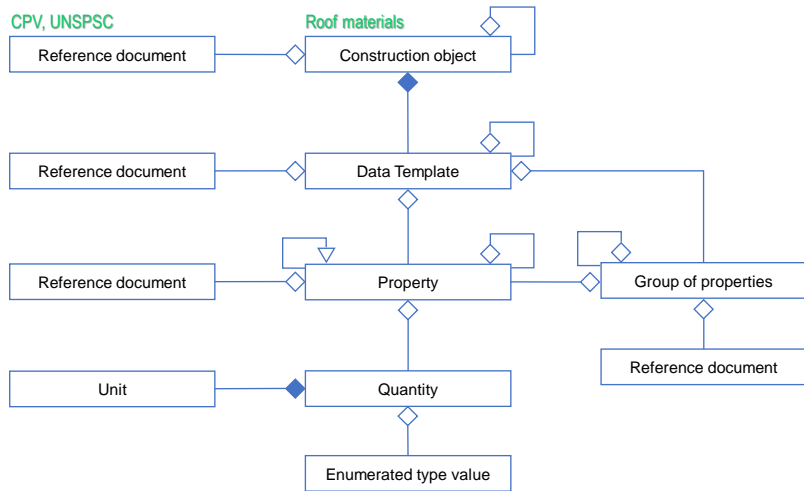
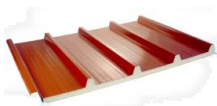


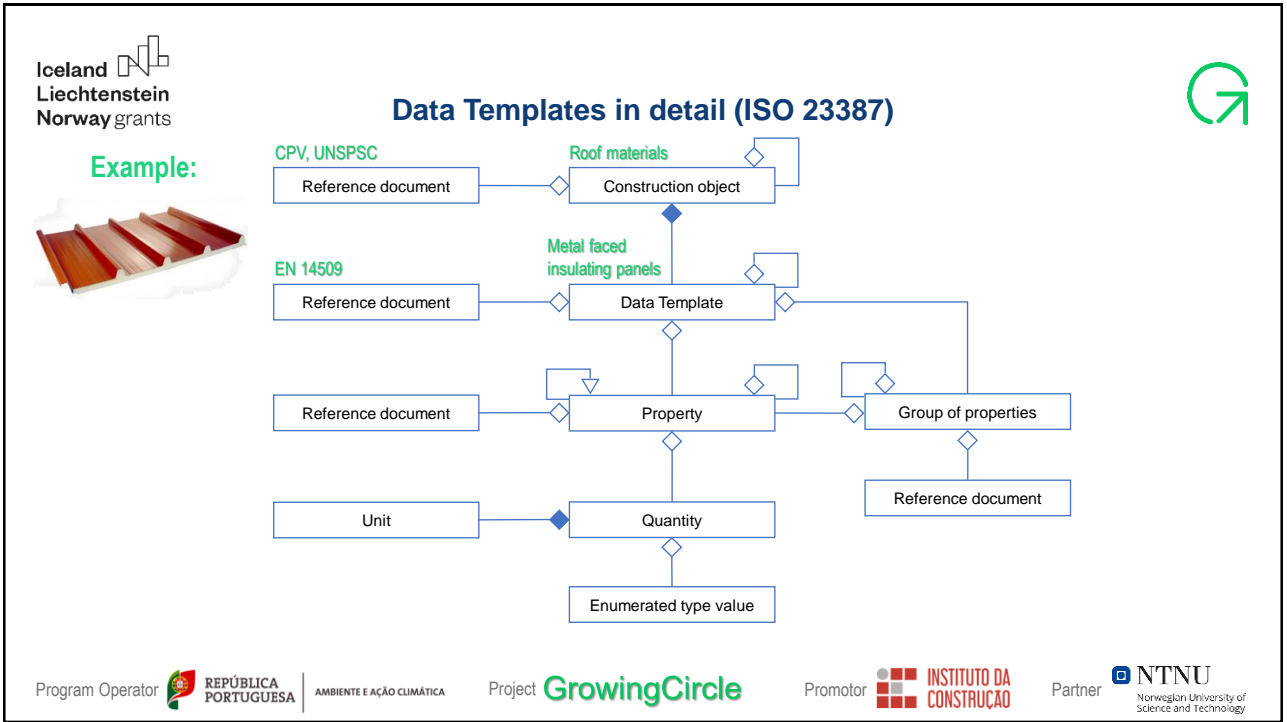
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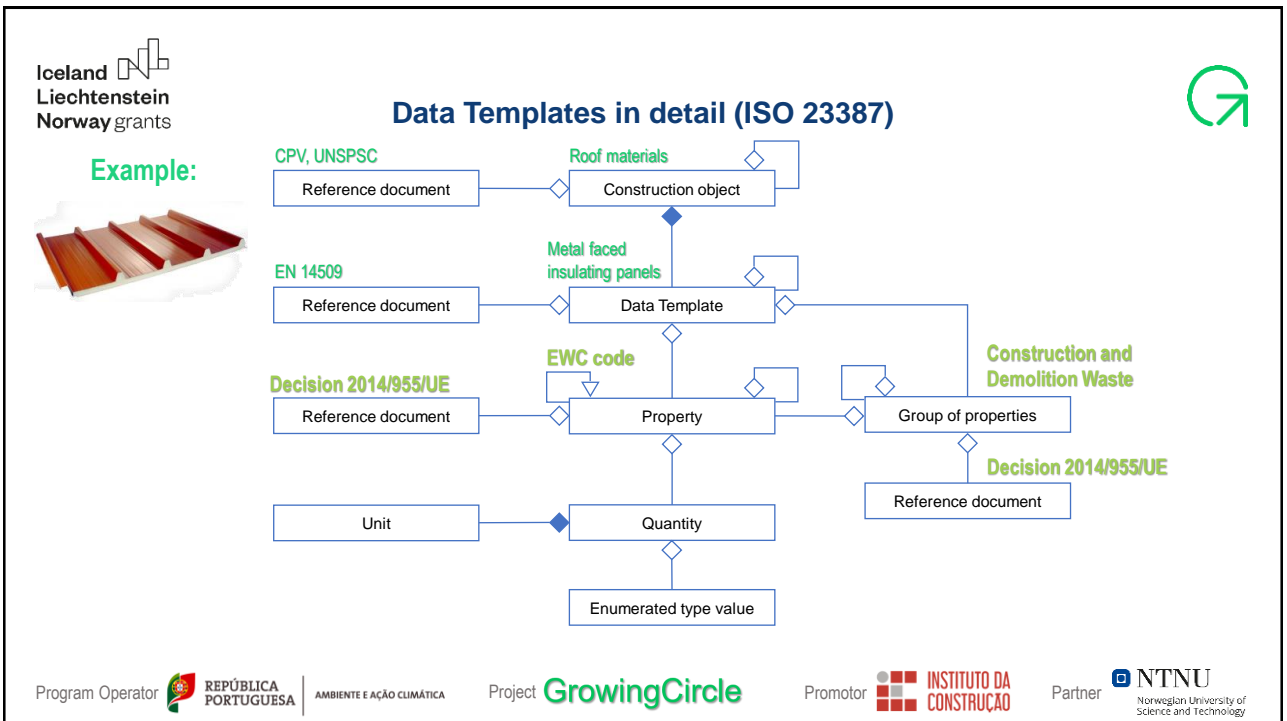
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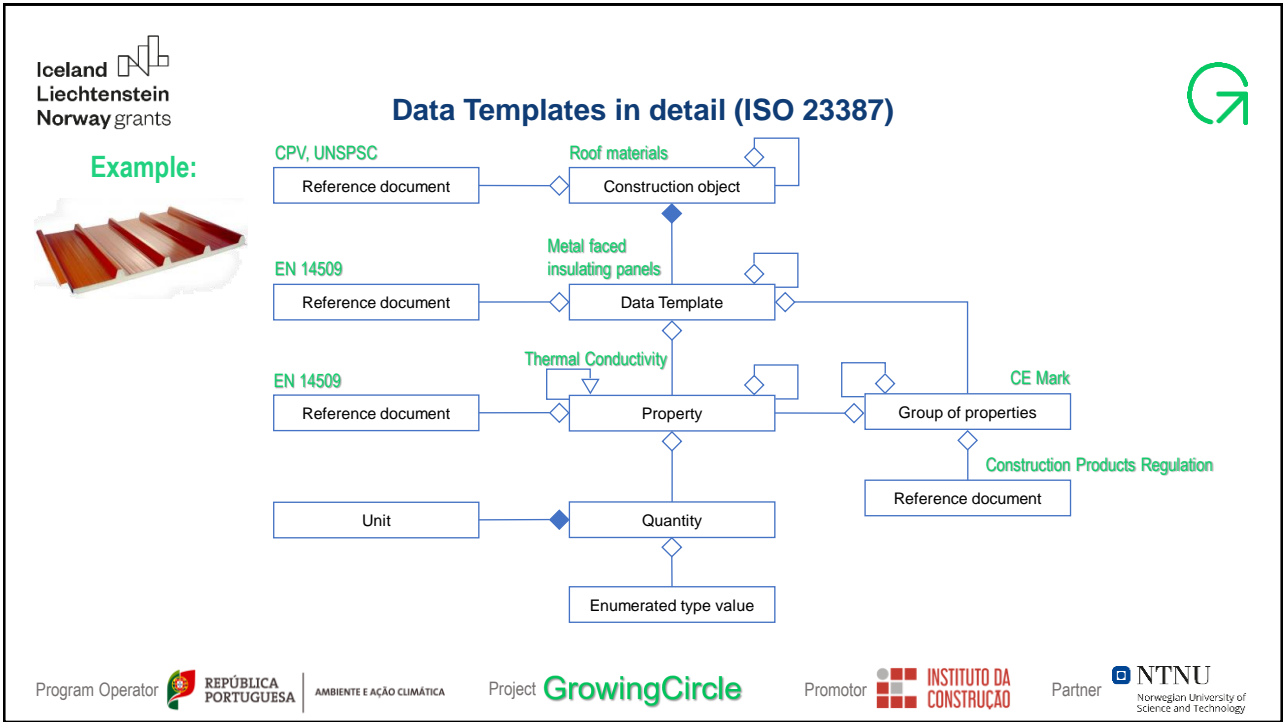




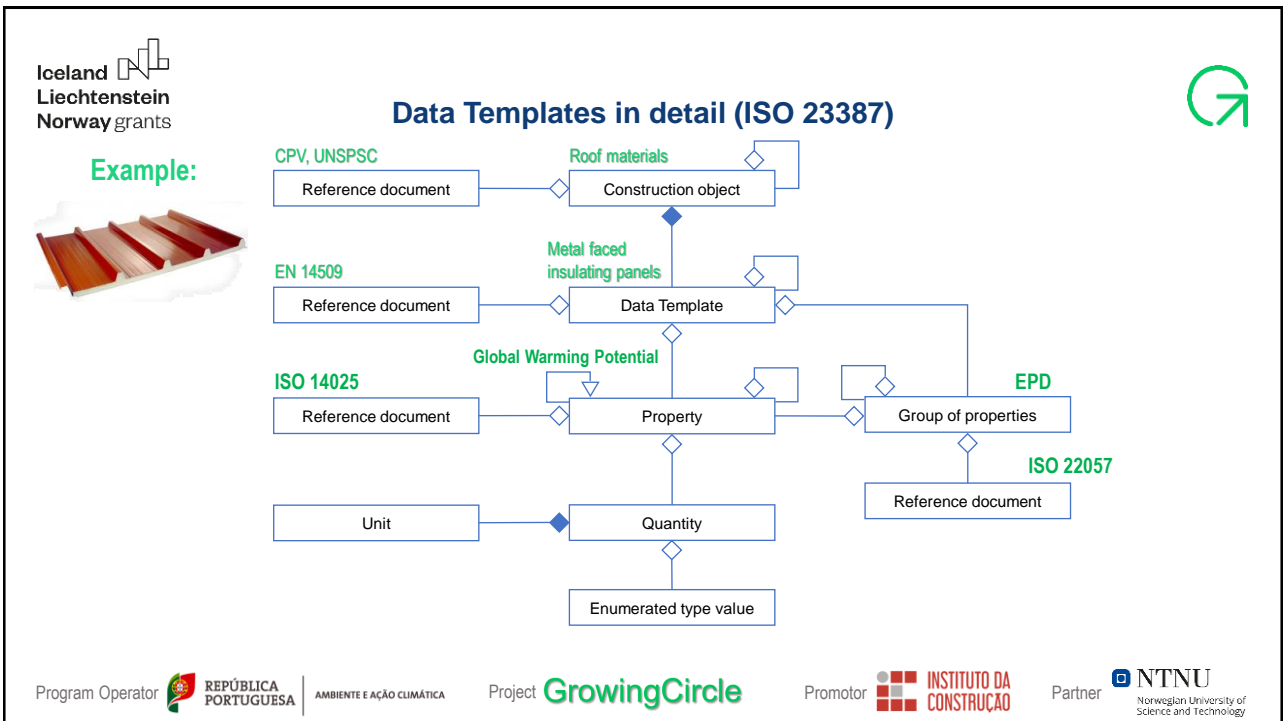
23



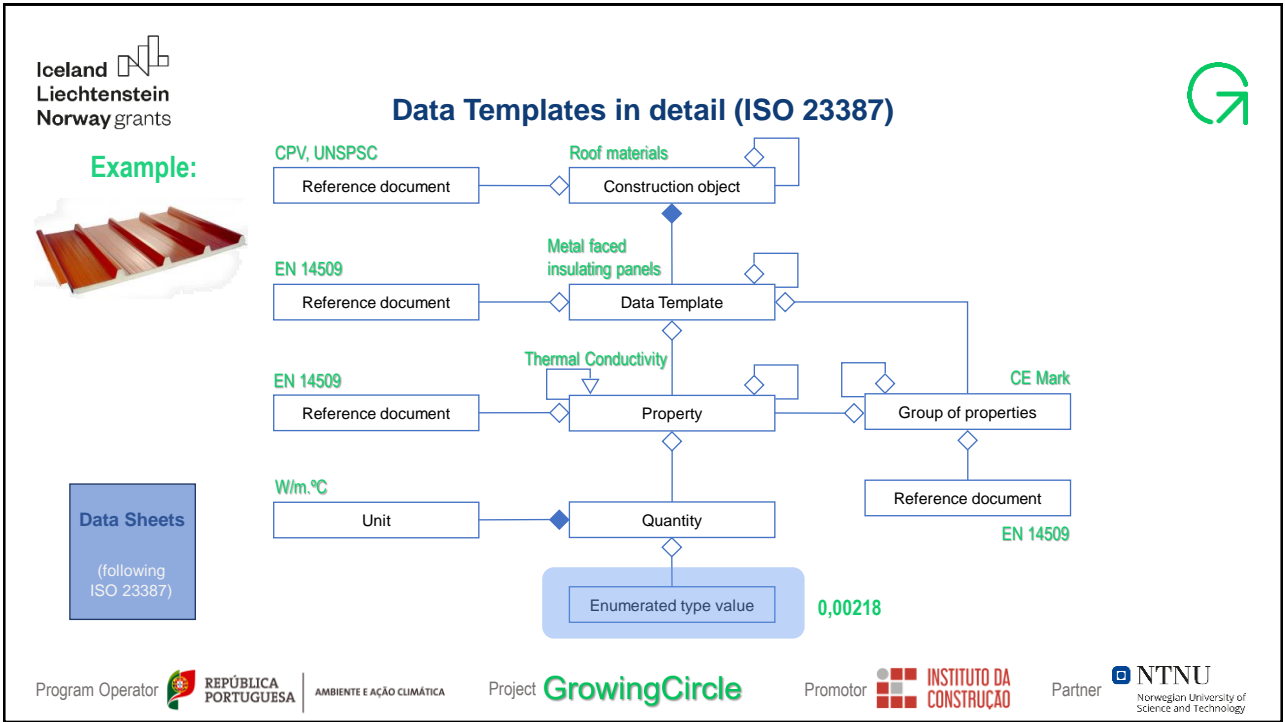
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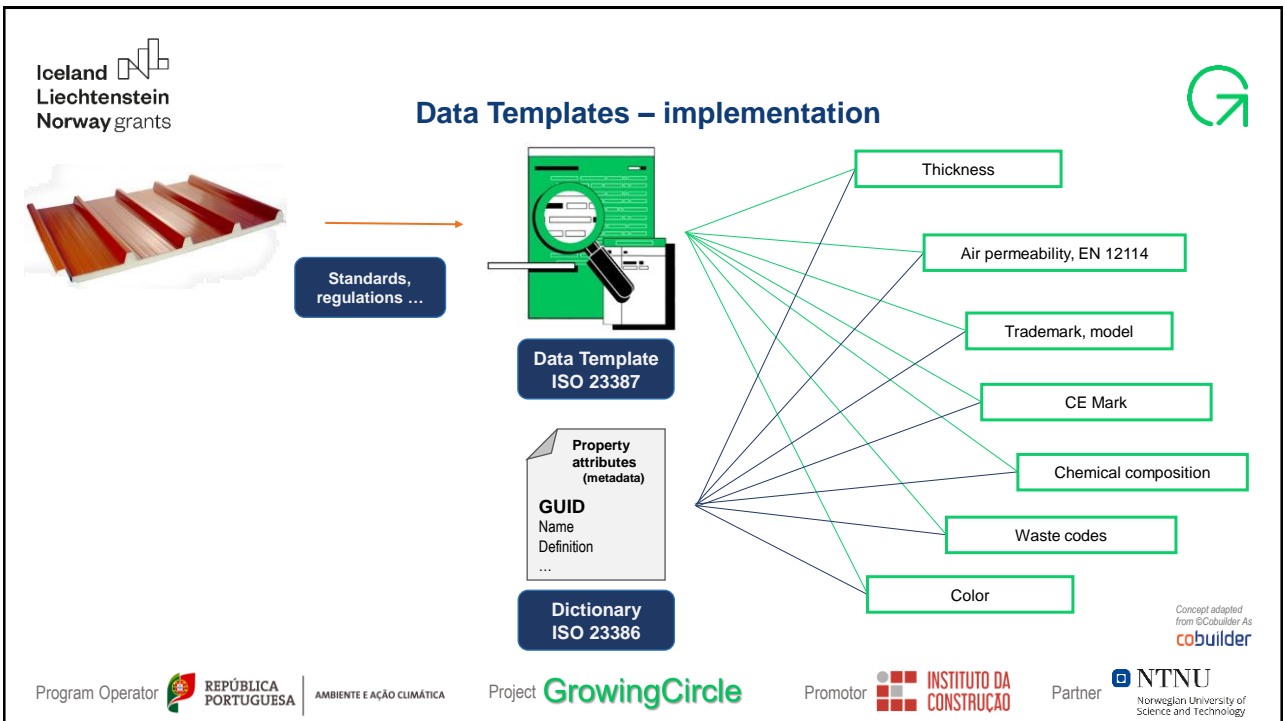
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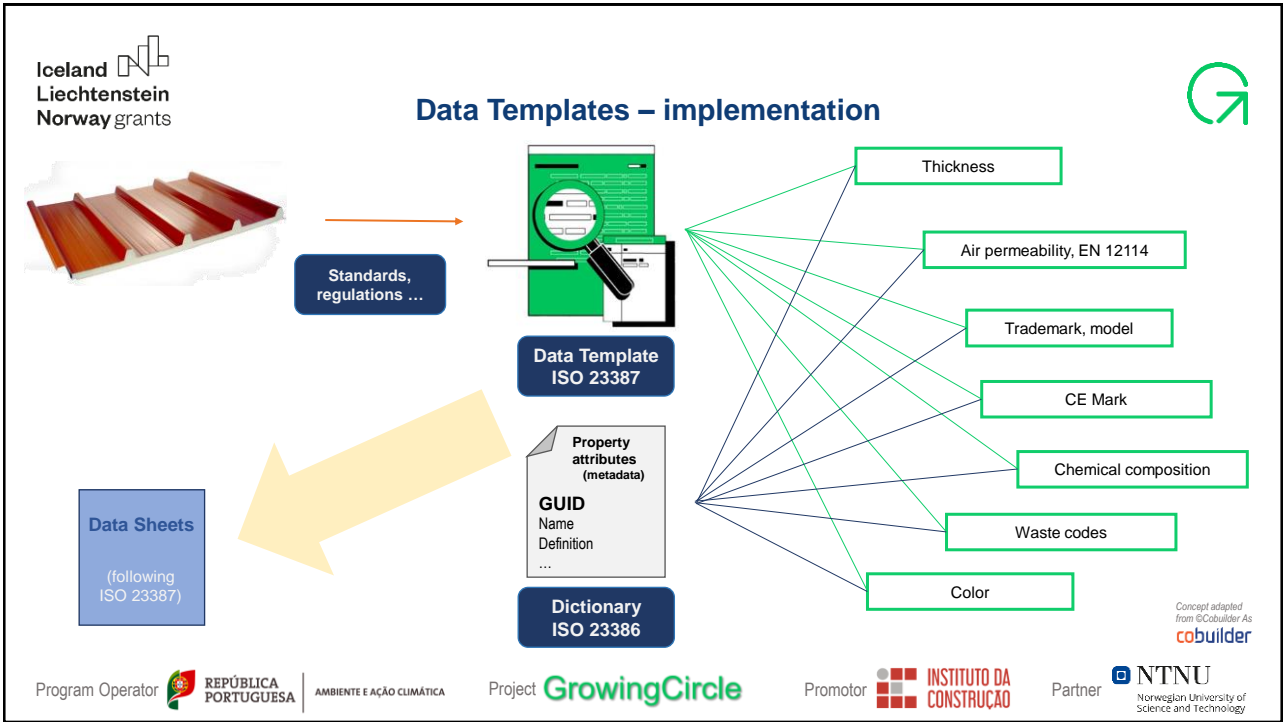
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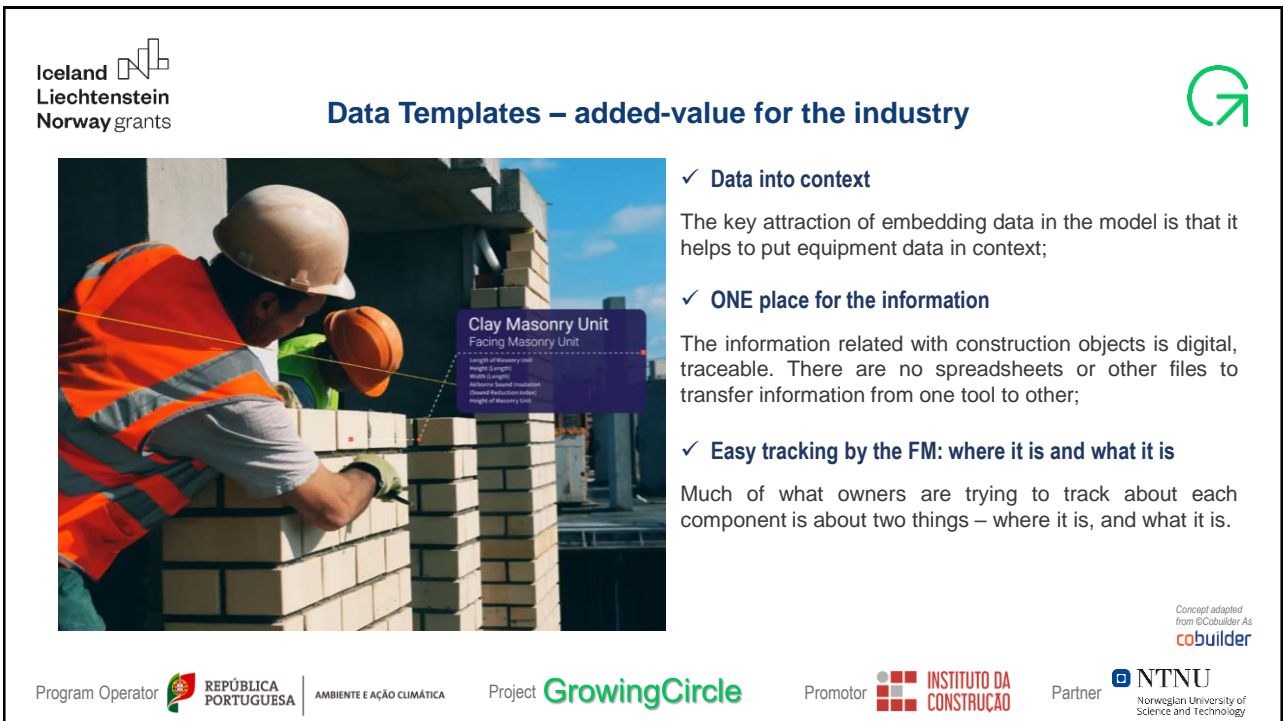
27



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Relevant Standards

Concept adapted from iCobuilder AS
cobuilder

- ISO 19650** Organization and digitization of information about buildings and civil engineering works, including BIM - information management using building information modelling
- ISO 12006-3 Organization of information about construction works (object-oriented)
- ISO 23386** Methodology to describe, author and maintain properties in interconnected data dictionaries
- ISO 23387** Data templates for construction objects used in the life cycle of any built asset
- ISO 17412** Building Information Modelling. Level of Information Need (LOIN). Concepts and principles
- ISO 17549-1/2** Information technology — User interface guidelines on menu navigation
- bSDD buildingSmart Data Dictionary** is an online service that hosts classifications and their properties, allowed values, units and translations
- ISO 22057** Sustainability in buildings and civil engineering works – Data templates for the use of EPDs for construction products in BIM

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Recap

Data Templates

Data Sheets
(following ISO 23387)

Thermal conductivity

Platforms, software,

Sustainability Thermal performance preview

Energy consumption simulation

Energy pre-certificate Compliance check

Energy Certificate

Consumption evaluation

End of life

Refurbishment

Re-use

Program

Preliminary Design

Technical Design

Construction

Handover

Use

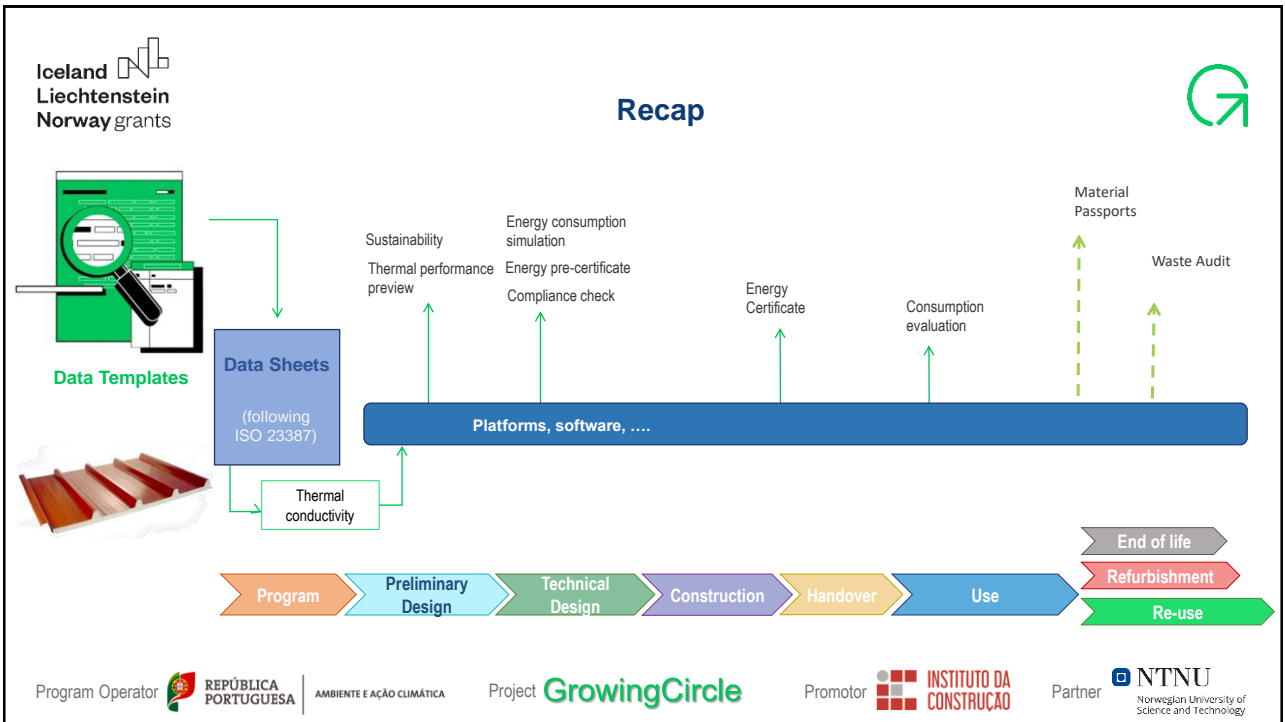
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Recap

Data Templates are standardised, interoperable metadata structures used to describe the characteristics of construction objects. **ISO 23387**

Keywords:

- Construction objects properties
- Digital information consolidation
- Machine-readable
- Data dictionary
- Data systematisation and traceability

Date Templates will consolidate information regarding:

- Manufacturer data
- Performance data
- Environmental data
- O&M data
- Geometric data
- Features data

- ✓ **Data Templates** acting as data-driven into Building's life cycle providing resemble and digital information for the phases of design, construction, use and deconstruction.
- ✓ **Data Templates** are the framework to support the development of Material Passports (data sheets).
- ✓ **Data Templates** deployment consolidating asset data will increases Construction Industry efficiency avoiding errors and decreasing lead times.
- ✓ **Data Templates** will promote a more Circular Construction optimising decommission analyses (mainly the waste audit) and providing a credible catalogue of the as-built assets.

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GrowingCircle



GrowingCircle project joins Instituto da Construção and Trondheim University

GrowingCircle - "Integrated Data for Efficient and Sustainable Construction" project was approved under the EEA Grants 2014-2021 "Environment, Climate Change and Low Carbon Economy Programme".

To enhance the construction sector digitalization trends it is necessary to develop mechanisms to foster information systematization, integration, management, maintenance and tracking about the built objects and the construction products that compose them.

Data Templates are the standard and interoperable metadata structures capable of responding to these challenges, contributing to the effective implementation of more circular, more efficient and environmentally friendly practices.

The project is promoted by IC – Instituto da Construção, Portugal with NTNU – Trondheim University, Norway as partner.

Partnership **cobuilder**

GrowingCircle and Cobuilder are developing case studies whose result will be, among others, a GrowingCircle catalog of construction products, according to the Data Templates (ISO 23387)

35

Video and exam



- **GrowingCircle project continues the awareness actions on Data Templates.**
- **This video aims to explain how Data Templates are relevant structures for the information traceability through the construction processes.**
- <https://www.youtube.com/watch?v=RnMsT4fOMk> (20:48)
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What was your result form the exam?



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