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BUSINESS INTELLIGENCE PLATFORM
VALUE CHAIN MODELLING?
Dissagregated Data sources
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Timberland Earthkeepers®

Get to know the boot that changed the way Timberland thinks about its products - our flagship "Earthkeepers®" line of boots. Everyone thought we were crazy when we set out to create our first eco-conscious boot in 2007. It seemed impossible at the time to make a boot that left a lighter footprint on the Earth we walk on, but that's exactly what we did. This one boot transformed the way we think about how we make our products, and inspired us to walk the talk beyond just one boot by building sustainability into all of our products. Explore the map to learn more.

Features:
- Click the icons below to reveal unique features of the supply chain. Each icon will highlight the facilities whose premises fall under one of the designated categories.

Legend:
- Distribution Centers
- Factories
- Tanneries
- Material Suppliers

Supply Chain Tracking
Business intelligence (BI) leverages software and services to transform data into actionable insights that inform an organization’s strategic and tactical business decisions. BI tools access and analyse data sets and present analytical findings in reports, summaries, dashboards, graphs, charts and maps to provide users with detailed intelligence about the state of the business.

The term business intelligence often also refers to a range of tools that provide quick, easy-to-digest access to insights about an organization’s current state, based on available data.
Business intelligence (BI) uses software and services to:

- **Transform data** into actionable insights

- **Inform an organization’s strategic and tactical decision-making.**
BI tools access data sets and present analytical findings in:

- Reports
- Summaries
- Dashboards
- Graphs
- Charts
- Maps

Providing users detailed information about the state of the organization (i.e. The Forest-City VC)
Activity 4.1 Modelling the Value Chain and 3S Carbon Accounting

**CONCEPTUAL DIAGRAM: Forest to City Value Chain**

**Support Activities**
- Governance
- Participation
- Design
- Planning
- Digitalization
- Logistics
- Carbon Transfer

**Primary Activities**
- Forest + Harvesting
- Lumber Production
- Processing + Manufacturing
- Building Assembly
- Building Maintenance + Renovation
- Disassembly
- Processing + Recycle

**Life Cycle Assessment**
- Transport
- Structure
- Maintenance
- Use
- End of Life

**Evaluation Matrix**
- Greenhouse potential: production "Cradle to Site"
- Greenhouse potential: life cycle "Cradle to Life"
- Biogenic carbon reservoir
- Prefab: proportion of renewable / reused / recycled materials
- Total building mass
- Carbon Storage
- Local materials - Transport distances

**Embodyed Impact**

**Lifecycle Economy**

**Georeferenced accountability of carbon emissions and credits**

**Bauhütte 4.0**

3S implementation in Schumacher Quartier

**Brandenburg**

THE PLAN

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THE PLAN

KPI tracking along the entire value chain

Scenario A

Scenario A

Scenario A
THE PLAN

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Scenario A

Scenario B
Interactive parameter adjustment (sliders)

Scenario C

Scenario A
THE RESULTS

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Implementation in Schumacher Quartier

Conceptual Overview

Regional Scale

Architectural Scale

Urban Scale

Legend

Bauhütte 4.0 Carbon sinking in the Berlin-Brandenburg forests

Carbon sequestration in architectural prototypes

Regional Scale

Architectural Scale

Urban Scale
The Results

Conceptual Overview

A sustainable Forest-to-City value chain for Berlin's present. A clear road map to achieve high values of Carbon Sequestration, Storage and Substitution. Existing forests in Berlin and Brandenburg can provide a renewable bio-based building material which coupled with high-performance building prototypes, ensure the city's capacity to become a massive carbon storage space.

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3S implementation in Berlin-Brandenburg

-69.0%
Average CO2 Proportion
Sinking/Storing

LCA (multi) phase selector

A1: Forest + Harvesting
A1.1: Carbon Sequestration
A1.2: Harvesting
A1.3: Tree Harvesting
A1.4: Forest Fire area
A1.5: Additional Products
A1.6: Soil Management
A1.7: Rough-cut Replanting
A1.8: Rough-cut Replanting

Forestry and Harvesting

This is a pre-manufacturing stage in which the processes of site preparation, tending and harvesting are considered. It reflects the capacity of the forest to act as a carbon sink both above as under ground level. The calculated figure is the net value, considering emissions from forestry operations minus the sink function of the forest.
Climate Smart Forest Economy Program | Breakthrough Initiative

**Bauhütte 4.0**

Carbon sinking in the Berlin-Brandenburg forests

This Dashboard displays forest information in Berlin and Brandenburg. By selecting either single or multiple patches in the map tool at the bottom left, information is displayed on the right: forest composition, CO2 Sinking, logistics and various other information on the whole process from the forest to the target Tech Republic.

### The Results

**Regional Scale**

- **Logistics CO2 Emissions (tons)**
  - Diesel: 323
  - Electric: 15.8
  - Rail: 3
  - Total: 99.41
  - Route Length (km): 16.79

- **Forest Area (Ha) and Ave Net Carbon Flux (gr/ha)**
  - Area: 111.93
  - Yearly Carbon Flux: 1.12M
  - Density Factor: 7.73

- **Predominant Species**
  - Laurus nobilis:

- **Wood Yield (m3)**
  - 1.84T
  - 5.1M Housing Units
  - 1.4M Market Value (€)
  - 4.8M Sunk CO2 (tons/yr)

### Parameter Slider

- **GEO filter**
- **Parameter**
- **Slider**

**Legend**
- geschlossener Nadelwald
- offener Nadelwald
- landschaftliche Schutzzone

**Mapbox © OpenStreetMap**

**Improve this map**

**Home**

**Prototypes**

**Urban**

Click to explore the complete value chain
The Results

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3S Implementation in Schumacher Quartier

Parameter sliders
- Transport Mode
  - Diesel
  - Electric
  - Rail
- Typpology distribution to be mixed in the Schumacher Quartier
  - Pathway A: 15%
  - Pathway B: 25%
  - Pathway C1: 30%
  - Pathway C2: 30%

Key Performance Indicators (KPIs)
- Carbon Storage: -214.99M kg
- Wood Volume: 1.63M m³
- Carbon Emission: 188.95M kg
- Water Use: 16.55bn L/cap
- Carbon Balance: -26.04M kg
- Electricity Use: 362.72M Wh/cap

Carbon Balance by Type
- Pathway A
- Pathway B
- Pathway C1
- Pathway C2

Concrete vs Wood carbon substitution
- Concrete: 215M kg
- Wood: -996M kg
• 11 Stages and 51 Sub-processes were discovered during the Forest-to-City Value Chain’s LCA

• The initial stage of forestry and harvesting holds the greatest carbon sinking and storage capacity, with an approximated -69% CO2 of the entire VC.

• 12 major sawmills were identified in the Berlin-Brandenburg region, which configure 12 corresponding forest zones based on minimal travelling distances.

• A total of 1.12 Million hectares of forest can be found in the region with an average Net Carbon Flux of -159.93 yearly tons per hectare. 1.07 million hectares of this surface corresponds to the Pinus Sylvestris species, or common pine wood.

• The region’s potential biomass yield is of 245.61 million m3, which could produce a total of 120.35 million m3 of usable timber and 84.25 million m3 of CLT/Glulam.

• This amount of wood can store up to 111.93 million tons of CO2 over a minimum of 70 years when used for new buildings construction.

• The average route length from the sawmills to the manufacturing facilities at the Tegel Tech Republic is of 99.41km, which account for 16.79 tons of emitted CO2 per trip when using Diesel-based lorries, but 5.82 tons with electrical vehicles, and only 3.23 tons with rail-based transport.

• An approximate amount of 5.1 million housing units could be built using this material as its main input (circa. 70%), with an estimated market value of 1.84 trillion euro.

• Currently existing pioneer building projects only incorporate 8-13% of wooden components which renders a carbon emission of approximately 1 218.86 tons of CO2 into the atmosphere per every 100 inhabitants.

• Highly ambitious experimental building prototypes use up to 73.11% wooden components and have a carbon storage capacity of 120.87 tons CO2 per every 100 inhabitants.

• The material manufacture energy source has a high impact on the carbon balance of different building types, with a potential reduction of 83.60% in carbon emissions (switching to wind generated electricity) or an increase of 51% (when switching to coal).

• The new residential development in Schumacher Quartier has the capacity to store 39586.92 tons of CO2 when using an 80% of experimental prototypes and 20% of at least carbon neutral building types, in combination with locally sourced wood.

• 57 450 tons of emitted carbon from concrete based materials in traditional building typologies could be substituted for 139 620 tons of stored carbon within wood components of the new experimental building prototypes.
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