

CIRCULAR ECONOMY - A GLOBAL CHALLENGE FOR CONSTRUCTION INDUSTRY.

2ND ECCA CONFERENCE

December 5th, 2017, Kołobrzeg, Poland

MIĘDZYNARODOWA KONFERENCJA „BUDOWNICTWO WOBEC GLOBALNYCH WYZWAŃ GOSPODARKI O OBIEGU ZAMKNIĘTYM”

5 grudnia 2017 r., Kołobrzeg



Novel Business Models and Value Provision Schemes

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Co-funded by the COSME programme
of the European Union



Cluster
Construcción
Sostenible

Motivation

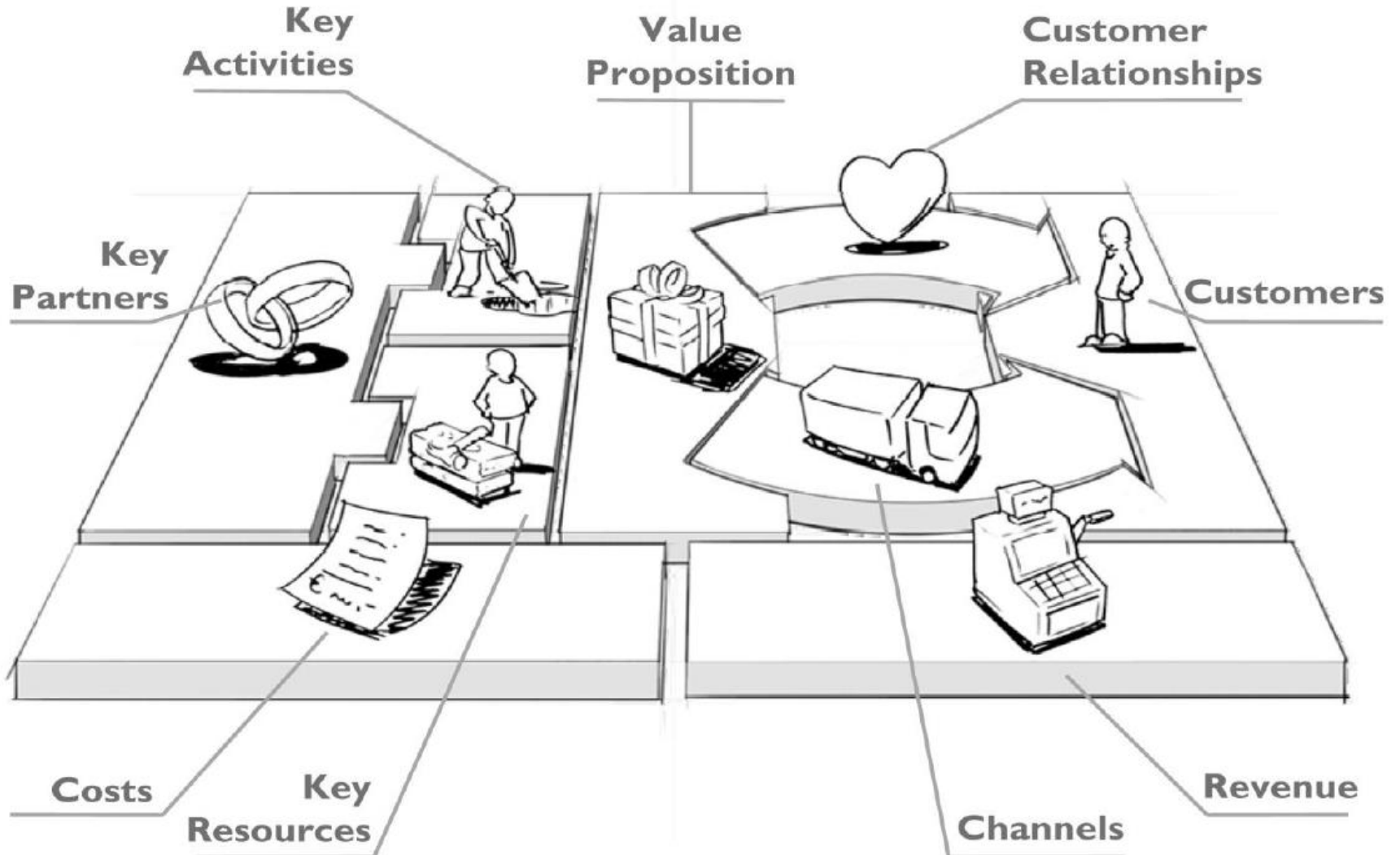
"A business model describes the rationale of how an organization creates, delivers, and captures value."

Osterwalder, A. & Pigneur, Y. 2010, p. 14

- ▶ Re-design is often challenging for established companies
- ▶ Newcomers quite often are the ones who are able to disrupt and re-design the value chains
- ▶ Changing business environment and breaking up of current value chains
- ▶ Circular construction business (eco)systems vs. business models
- ▶ Little existing framework to support business model innovation in the context of a circular economy.



9 Traditional Building Blocks



The Novel Business Model

- ▶ Circular business models are special in the sense that they look for **value creation in places usually of little interest to companies that operate in the traditional linear production paradigm.**
- ▶ Circular business models thus **combine the 9 building blocks in innovative ways.**
- ▶ Which circular principles are most relevant depends on a number of factors such as:
 - ▶ Particular trade and market conditions
 - ▶ Focus, interests and values of the company
 - ▶ Existing competences and capabilities



4 Ways to Create Value

- ▶ 4 distinct ways in which companies can create value in the circular economy, all of which are based on an improvement of material productivity.
 1. **Power of inner circle** (keeping products alive and operating for as long as possible and preferably with the original owner or user)
 2. **Power of circling longer** (keeping products in as many consecutive cycles as possible and prolonging the time of each cycle)
 3. **Power of cascaded use** (diversify reuse of products and materials)
 4. **Power of pure circles** (uncontaminated material streams)

"In general, the tighter the circles are, the larger the savings should be in the embedded costs in terms of material, labour, energy, capital and of the associated rucksack of externalities, such as GHG emissions, water, or toxic substances."

(Ellen MacArthur Foundation 2013c, p.30).



5 archetypical Business Models (Accenture)

- ▶ **Circular supplies:** phasing out scarce resources by using fully renewable, recyclable or biodegradable resources
 - ▶ Target: companies that deal with scarce commodities or have a major environmental footprint

 - ▶ **Resource recovery:** capturing value at the end of one product lifecycle to feed into another via innovative recycling and upcycling
 - ▶ Target: companies with large volumes of by-product, or waste material from products that can be both reclaimed and reprocessed cost effectively

 - ▶ **Product life extension:** extending the lifecycle of products and assets by repairing, upgrading, remanufacturing or remarketing products
 - ▶ Target: capital-intensive B2B (industrial equipment manufacturing) and B2C in markets where new products bring only little extra performance over the previous version
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5 archetypical Business Models (Accenture)

- ▶ **Sharing platforms:** collaboration among product users to facilitate sharing of overcapacity or underutilization thus increasing productivity
 - ▶ **Target:** manufacturing companies, whose products and assets have a low utilization or ownership rate

- ▶ **Product as a service:** provides products through lease or pay-for-use arrangements and the company has to ensure durability and upgradability.
 - ▶ Traditionally, factors such as product longevity, reusability and sharing have been considered a cannibalization risk. Yet this BM repositions these elements to become drivers of revenue and reduced costs.
 - ▶ **Target:** companies whose products are expensive to customers and where manufacturing companies have an advantage relative to their customers in maintenance and upgrading of the products



Interlinkages between 5 business models and 4 principles of value creation

	Circular supplies	Resource recovery	Product life extension	Sharing platforms	Product as a service
Inner circle					
Circling longer					
Cascaded use					
Pure circles					



Making a Business Case

TOP BARRIERS FOR ADOPTION



38%
Insufficient business case

36%
Cost to reclaim used goods

36%
Lack of understanding/ education

TOP INCENTIVES Consumers



56%
Rebate in the form of a cash back



47%
Convenience returning product at brick-and-mortar location



42%
Ability to return product using pre-paid shipping

TOP INCENTIVES Industry



59%
Producer or distributor physically reclaims product



51%
Turnkey packaging and pickup service



48%
Manufacturer refurbishes product and returns for continued use

Externalities vs Incentives

► **Incentive alignment:**

- Value creation for all stakeholders
- The challenge of re-designing business ecosystems is to find the "win-win-win" setting that balances the self-interests of involved actors and sustainability impacts

How to align incentives throughout the supply chain so that, from the design stage to customer engagement, companies actively consider the use of sustainable materials and features such as durability and reparability at the core of their product strategy?



**Sustainability and circularity evaluation
of the business model**

Business ecosystem level

Trends and drivers

Stakeholder involvement

Business level

Key partners
(suppliers,
service
providers,
platform
owners,
reverse
logistics
partners)

Key
resources

Key activities

Value
proposition

Customer
relationships
&
collaboration

Channels &
logistics
(direct and
reverse)

Customer and
stakeholder
identification
and
understanding

Cost structure

Revenue streams

Sustainability impact

Sustainability requirements
(environment, social, and business)

Sustainability benefits
(environment, social, and business)

4 Thematic Areas

1. Smart Buildings
2. CDW Management
3. Wood-based Building & Refurbishment Systems
4. Bioclimatic Houses

	Circular supplies	Resource recovery	Product life extension	Sharing platforms	Product as a service
Inner circle			1, 4	1	1
Circling longer	1, 3	2, 3	1	1	2
Cascaded use		2, 3			
Pure circles	3, 4	2, 3, 4			



Cross-sectoral value provision takeaways:

- ▶ Circular Economy must be an economy.
 - ▶ Marketplace creation, access, and promotion is key.
 - ▶ Effective information aggregation is key, market prices do not internalize externalities.
 - ▶ Imperfect information, uncertainty and long payback time remain a challenge.
 - ▶ “First mile” logistics are critical.
 - ▶ Societal trend of reverting back to natural components in built environment coupled with resourced efficiency gains and rising consumer awareness vs traditional process inertia.
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General takeaways (Importance of ECCA)

- ▶ Overcoming challenges in B2B cooperation: incorporating circular practices can require multiple companies to adjust their operations.
- ▶ There are potentially large transaction costs and delays in negotiating with partner companies.
- ▶ Businesses are more likely to collaborate where they do not directly compete (for instance, electricity distribution companies that operate in separate areas) or if they focus on different sectors.
- ▶ Forward logistics & economies of scale, vs lack of economies of scale in first-reverse-mile logistics can be cost-prohibitive.



Thank you for your attention

Dziękuję za uwagę

*Sustainability is not a luxury;
it is a basic human right.*

Jim McClelland
Editor, journalist, and futurist



Smart Buildings

Trends & drivers: EU regulations and requirements, enabling technologies, energy efficiency, growing consumer awareness, shared economy, scarce resources & growing urban needs, increasing consumption of resources caused by rapid urbanization

Stakeholder involvement: close collaboration with municipalities, urban planning organizations, customers,

Key partners:

-Municipalities and urban planning organisation to cooperate on revitalization

Key resources:

industry data and R&D

Key activities:

Concept development, market testing & consulting

Value proposition:

Radical increase in efficiency of resource use, sharing, separation and collection, modular design, Integrated eco/sustainable design

Customer relationship & collaboration:

B2B, B2C, C2C, network effects,

Customer & stakeholder identification & understanding:

-active family
-business professionals
-elderly people

Channels & logistics: smart platforms and databases

Sustainability requirements (environment, social, business): renewable energy, adequate workforce

Sustainability benefits (environment, social, business): resource-efficiency, energy efficiency, reuse, local impact, green city centers with functionalities of country living,

CDW management

Trends & drivers: EU regulations and requirements, enabling technologies, energy efficiency, growing consumer awareness, curbing energy use and pollution, smart specialization strategies across the EU region, increasing amount of construction, demolition and municipal waste

Stakeholder involvement: Companies from various sectors involved in waste generation and receival, treatment and production, investors, R&D institutions, Decision makers and legislative bodies, designers, architects, engineers, various value chain clusters

Key partners: various value chain clusters, designers, architects, R&D institutions, engineers, intermediaries

Key resources: competencies & skills (dispersed), demolition

Value proposition: Industrial and R&D waste valorization in construction, on-site recycling

Customer relationship & collaboration: Facilitating B2B customers', business, smart matching platform

Customer & stakeholder identification & understanding: recycling centers, other sellers for used products, both value ease and accessibility,

Key activities: Promote efficient use of resources, create a waste marketplace

Channels & logistics: web, industry events

Cost structure: Technology development and updating,

Revenue streams: buyers of building components and modules and parties responsible for waste disposal

Sustainability requirements: the use of simple, reusable construction components

Sustainability benefits: waste reduction, emission and energy use reduction, more efficient use of resources

Wood-based buildings & refurbishment systems

Trends & drivers: EU requirements and regulations regarding emissions, pollution and energy use, growing consumer awareness, natural solutions

Stakeholder involvement: wood construction clusters, designers, architects, RDI, local governments, consumers

Key partners:
wood
construction
clusters,
designers,
architects, RDI

**Key
resources:**
wood,
technology,
current
building

Key activities: developing
new wood designs and
refurbishment systems,
promotion & dissemination

**Value
proposition:**
maximum
resource
utilization by
transforming into
smaller
dimensions –
leading to closed
material loops

**Customer
relationship &
collaboration:**
B2B, B2C

**Channels &
logistics:**
web, industry

**Customer &
stakeholder
identification &
understanding:**
consumers
value
affordable,
sustainable and
natural
solutions

Cost structure: Technology development and updating

Revenue streams: purchases and use
by construction companies,
consumers /end users

Sustainability requirements:
sustainable wood sourcing,

Sustainability benefits: wood cascade use
ensures the maximum resource utilization

Bioclimatic house

Trends & drivers: EU requirements and regulations regarding emissions, pollution and energy use, growing consumer awareness, natural solutions, curbing energy use and pollution, scarce resources & growing urban needs, energy efficiency

Stakeholder involvement: close collaboration with green companies, consumers, producers, designers, engineers, policy makers and evaluators, third parties: consulting, marketing, and strategy, academia

Key partners: green companies, architects, agro industry (i.e. hemp), natural material producers, broadly understood construction sector

Key resources: technology, current building stock

Key activities: New standardization practices, promoting natural construction – wood has several lives

Value proposition: bioconstruction as full regeneration of the natural environment, integrated eco/sustainable design of new and retrofitted buildings

Customer relationship & collaboration: B2B, B2C, C2C

Channels & logistics: Social networks as access points: conferences, match making activities

Customer & stakeholder identification & understanding: consumers value affordable, sustainable and natural solutions

Cost structure: technology set up and updating, market research and network formation

Revenue streams: purchases and use by construction companies, consumers/end users

Sustainability requirements: sustainable natural material sourcing, building stock compatibility with bioconstruction

Sustainability benefits: Extending lifetime durability of products and components, infusing life and new functionality (innovative design) into unattractive buildings and avoiding demolition