# Count On Cooling Webinar

## Energy as a Service
## cutting emissions, creating jobs, lowering energy bills... meeting EU climate goals

Tuesday 19 May 2020 – 9.30 - 11.00

# Instructions to participants

- All participants should remain in mute mode during the entire time of the webinar
- Only speakers will unmute themselves during their time of presentation and Q&A session
- Speakers will not take questions after their respective presentations, but a 15 minutes Q&A session will take place at the end of the webinar
- During the Q&A session, participants are kindly requested to submit their questions through the chat to “Everyone”
- The EPEE Secretariat will read these questions to the speakers
- If time doesn’t allow to cover all questions, they will be submitted to speakers after the webinar and we will keep you informed of their response
- Presentations will be shared after the webinar
- Please note that this webinar is recorded

# Webinar programme

| Timing | Agenda | Speakers |
|---|---|---|
| 9.30-9.45 | Setting the scene: EPEE's 5-step approach to deliver sustainable cooling | Andrea Voigt, EPEE Director General |
| 9.45-10.00 | Case study #1: Cooling as a Service | Dimitris Karamitsos, Senior Energy Efficiency Business Developer Specialist, BASE |
| 10.00-10.15 | Case study #2: Heating as a service | Roxanne Pieterse, Research Manager, Heating Business Service, Delta-EE |
| 10.15-10.30 | Case study #3: Lighting as a service | Thomas Leenders, Manager Public & Government Affairs Benelux, Signify |
| 10.30-10.50 | Q&A | |
| 10.50-11.00 | Closing remarks | Andrea Voigt, EPEE Director General |

**Dimitris Karamitsos**
**BASE**

**@D_Karamitsos**
**@Energy_BASE**

**Roxanne Pieterse**
**Delta-EE**

**@delta_ee**

**Thomas Leenders**
**Signify**

**@Leenders82**
**@SignifyNL**

#CountOnCooling

CountOn Cooling

# A five-step approach to deliver sustainable cooling

Andrea Voigt, EPEE


There is no European Green Deal without sustainable cooling
CountOnCooling VIDEO

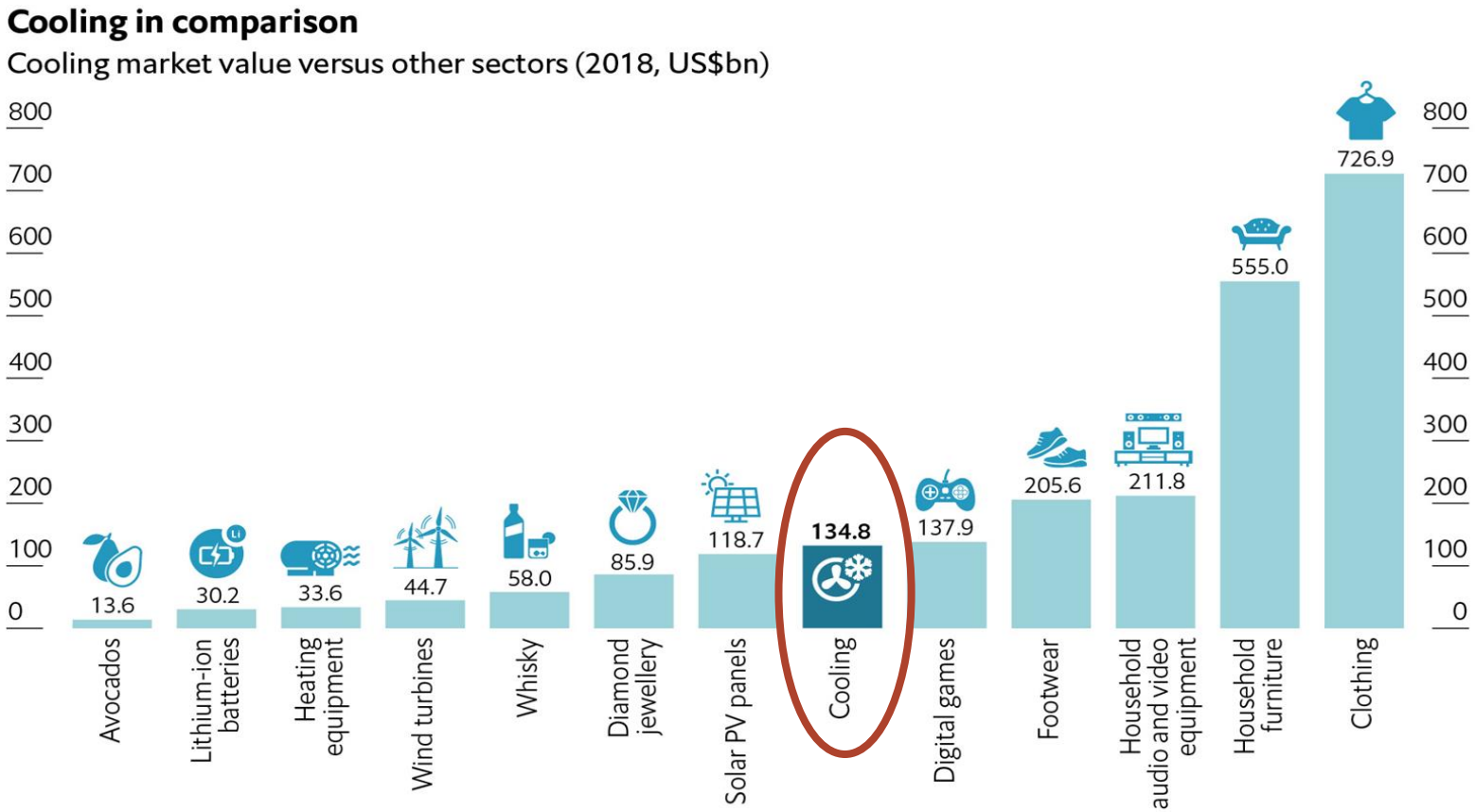
## Who is EPEE?

- Founded in 2000
- Headquartered in Brussels
- Currently 50 members from 3 continents
  - **Asia**
  - **Europe**
  - **North America**
- Representing the full value chain of the refrigeration, air-conditioning and heat pump industries

EPEE

The voice of the heating, cooling and refrigeration industry

# Cooling is a big industry and demand is set to grow




Source: EIU; Clean Cooling Landscape Assessment; Transparency Market Research; Grand View Research; Alrosa; Newzoo; Power Technology; Allied Market Research

# It contributes to many sustainable development goals

## Making sustainability cool

How cooling will help achieve priority SDG goals

**Food Security**
Scaling up fresh and safe food provision and combating waste

**Health**
Combating heat stress and scaling up vaccines

**Education**
Boosting student performance and combating fatigue

**Employee Productivity**
Combating damage to employee well being from uncool conditions, and reducing productivity losses

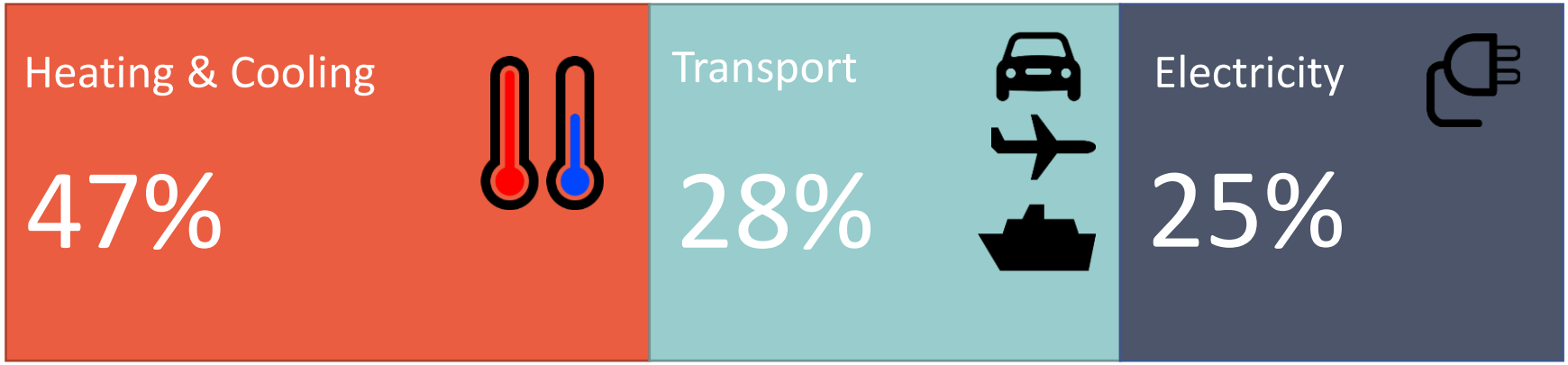
**Societal Inequality**
Preventing hurt to marginalised citizens: women and the poor

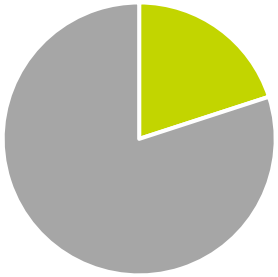
? ...

Source: EIU; UNDP

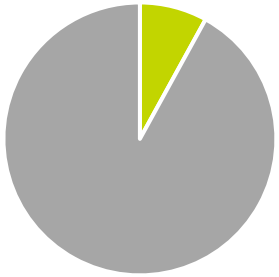
# It can contribute significantly to the EU‘s climate and energy goals

Final energy consumption in the EU ktoe

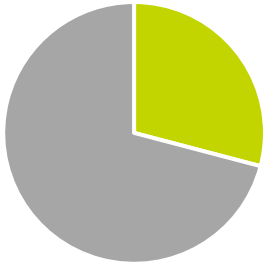


**20%** share of REN



**8%** share of REN



**32%** share of REN

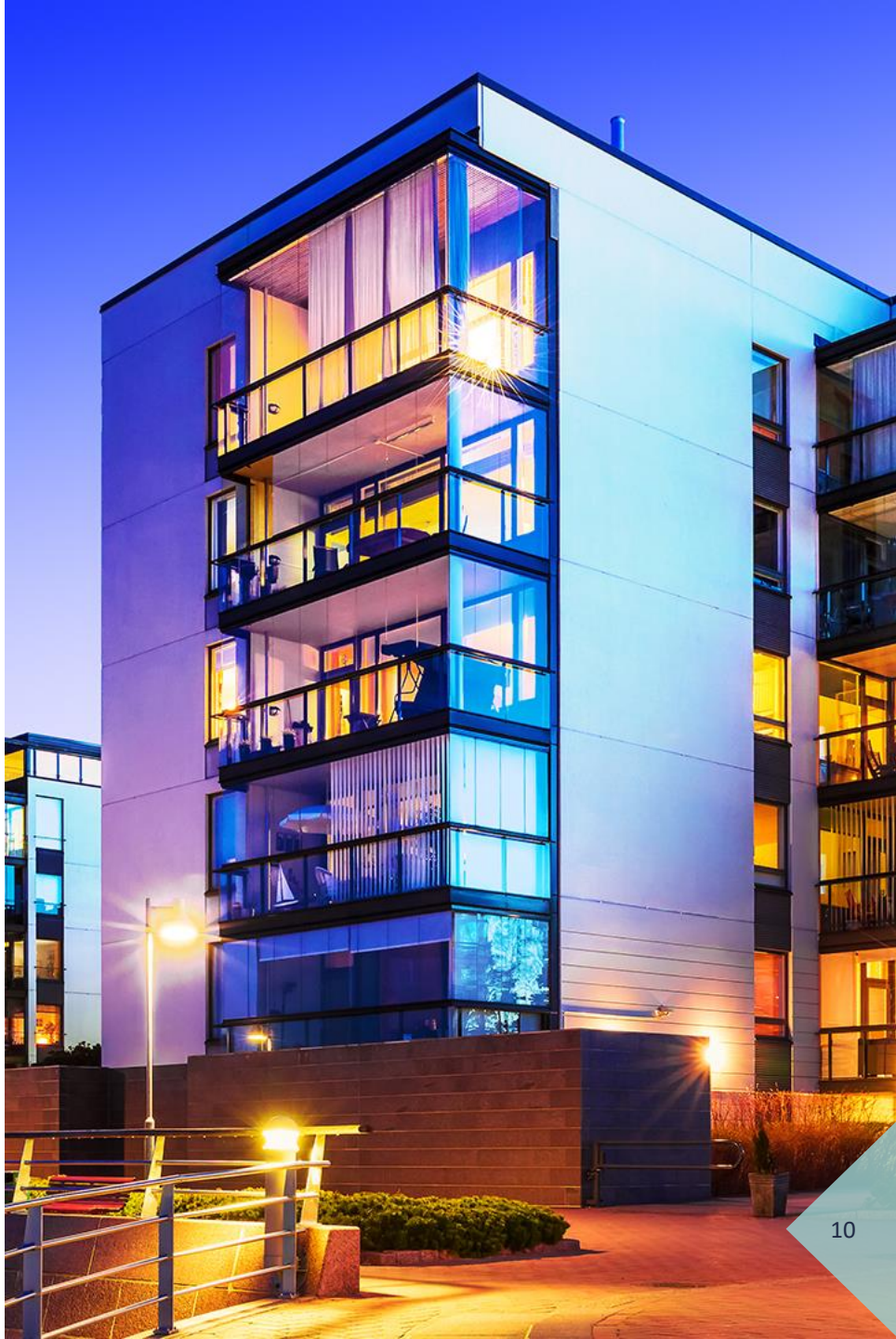
#CountOnCooling



Eurostat, Shares Summary results 2018

# Many solutions are readily available

- **Heat pumps** or photovoltaics to relieve burden from the electricity infrastructure
- **District heating and cooling** networks for large buildings, building clusters or whole cities
- **On-site energy storage** where cold and heat can be used as thermal energy batteries
- **Demand response schemes**, providing flexibility to the grid and shifting peak demand
- **Integration of decentralised systems** into thermal networks
- **Use of rejected heat from cooling systems** to further enhance energy efficiency and system integration
- **Building automation and control systems**, remote monitoring, optimised controls
- **Etc.**



# So what is standing in the way?

- Higher upfront investment costs
- Silo thinking and lack of cooperation between demand and supply side
- Limited end user awareness of the potential life cycle cost reductions of improved efficiency
- Lack of awareness and skills at installer level
- Split incentives landlord/tenant
- Inadequate accounting rules
- Lack of political awareness of the potential for improved efficiency and the significant benefits of an integrated approach – and therefore a lack of clear financial drivers
- Lack of adequate business models
- Market distortion due to high electricity prices and ongoing fossil fuel subsidies
- Etc.

01.

# Case study #1: Cooling as a service

**Dimitris Karamitsos, Senior Energy Efficiency Business Developer Specialist, BASE**

CaaS

Cooling as a Service

Refresh the planet

# Market Transformation: Servitisation of Cooling Industry

BASE

*Driving investment in sustainable energy*

KIGALI

COOLING EFFICIENCY PROGRAM

CaaS

About BASE

# Basel Agency for Sustainable Energy

BASE

*Driving investment in sustainable energy*

BASE is a Swiss not for profit foundation and a Specialised Partner of UN Environment.

BASE develops innovative, actionable financial strategies and market-driven solutions to unlock investment in sustainable energy and to tackle climate change.

CaaS

The Challenge

# Cooling demand is rising dramatically

Cooling demand will **triple by 2050, from 10 to 30% of global electricity consumption** (= China‘s electricity use today) *

*IEA, The Future of Cooling, 2018

CaaS

Opportunity

# Significant investments in cooling systems upcoming

Market of **6.9 trillion USD** over next 30 years (**230 billion USD/year**) that could be invested in clean efficient cooling

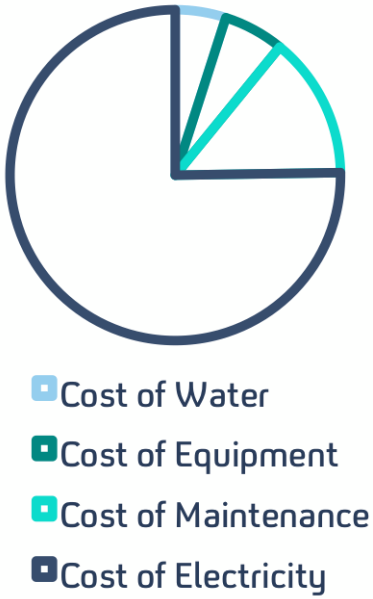
*IEA, The Future of Cooling, 2018

CaaS

Opportunity

# Energy-efficient systems are cheaper over the long term

Life cycle cost (12 years)




- 90%+ of costs related to operation and maintenance
- Large savings potential with short payback periods

BUT:

- Business and building owners are not investing in more efficient systems!

* BASE calculations with inputs from technology providers

CaaS

The Challenge

# Investment decision is sensitive to purchase price

Key barriers:

- Higher upfront cost of efficient technology (competing against cheap and inefficient tech)
- Lack of trust in performance
- Prioritisation of investment in core business

CaaS

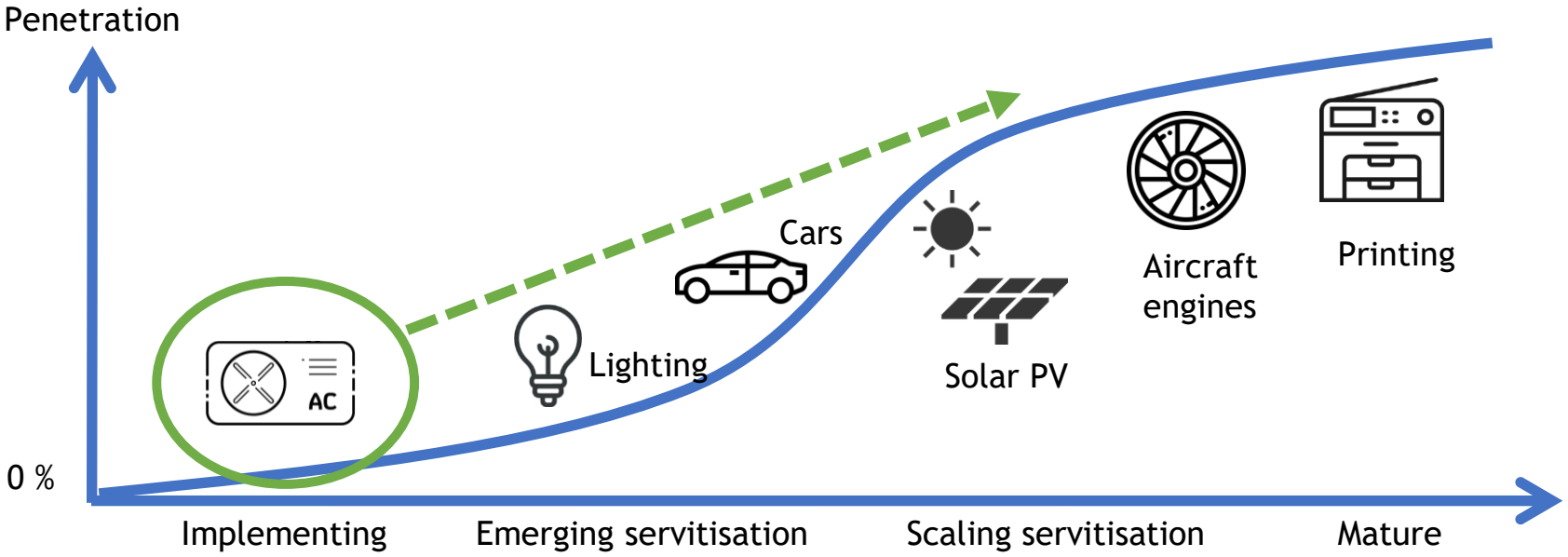
**Cooling as a Service**
Refresh the planet

# The Solution
# Cooling as a Service (CaaS)

CaaS

CaaS Solution

# Servitisation: mega-trend growing rapidly across industries



CaaS

CaaS Solution

The Lab
Driving Sustainable Investment

Endorsed by the **Global Innovation Lab for Climate Finance** as one of 2019's most innovative financial instruments among **250+ applicants**

- Pay-per-use model
- Providers own equipment
- CAPEX to OPEX
- Aligns incentives for efficient production and efficient consumption
- Makes lower life-cycle cost of efficient cooling tangible
- Includes capitalisation mechanism of CaaS providers (SPV, sale-leaseback)

CaaS

# Differentiation from similar models

| Instrument | Differentiation from CaaS |
|---|---|
| Energy Service Company (ESCO) : Shared savings and guaranteed savings Energy Performance Contracting | Payments dependent on energy savings. Instead a CaaS payment is agreed in advance as a function of actual usage. |
| District cooling | District cooling aggregates demand in large-scale systems. Instead CaaS can be applied to single buildings. |

CaaS

CaaS Solution

# Key actors involved

Clients


Technology Providers


Banks / Investors

CaaS

CaaS Solution

## Advantages for customers

- No capital expenditure
- Reduced operating expenses
- Service is off-balance
- No more performance risks
- Full out-sourcing of cooling service
- Customer can focus and invest in core business

CaaS

CaaS Solution

## Advantages for technology providers

- Deploy full potential of technology
- Increase demand for energy efficient solutions
- Predictable and continuous revenue streams
- Brining additional value by selling outcome instead of selling equipment and parts

BASE

CaaS

CaaS Solution

## Advantages for banks and investors

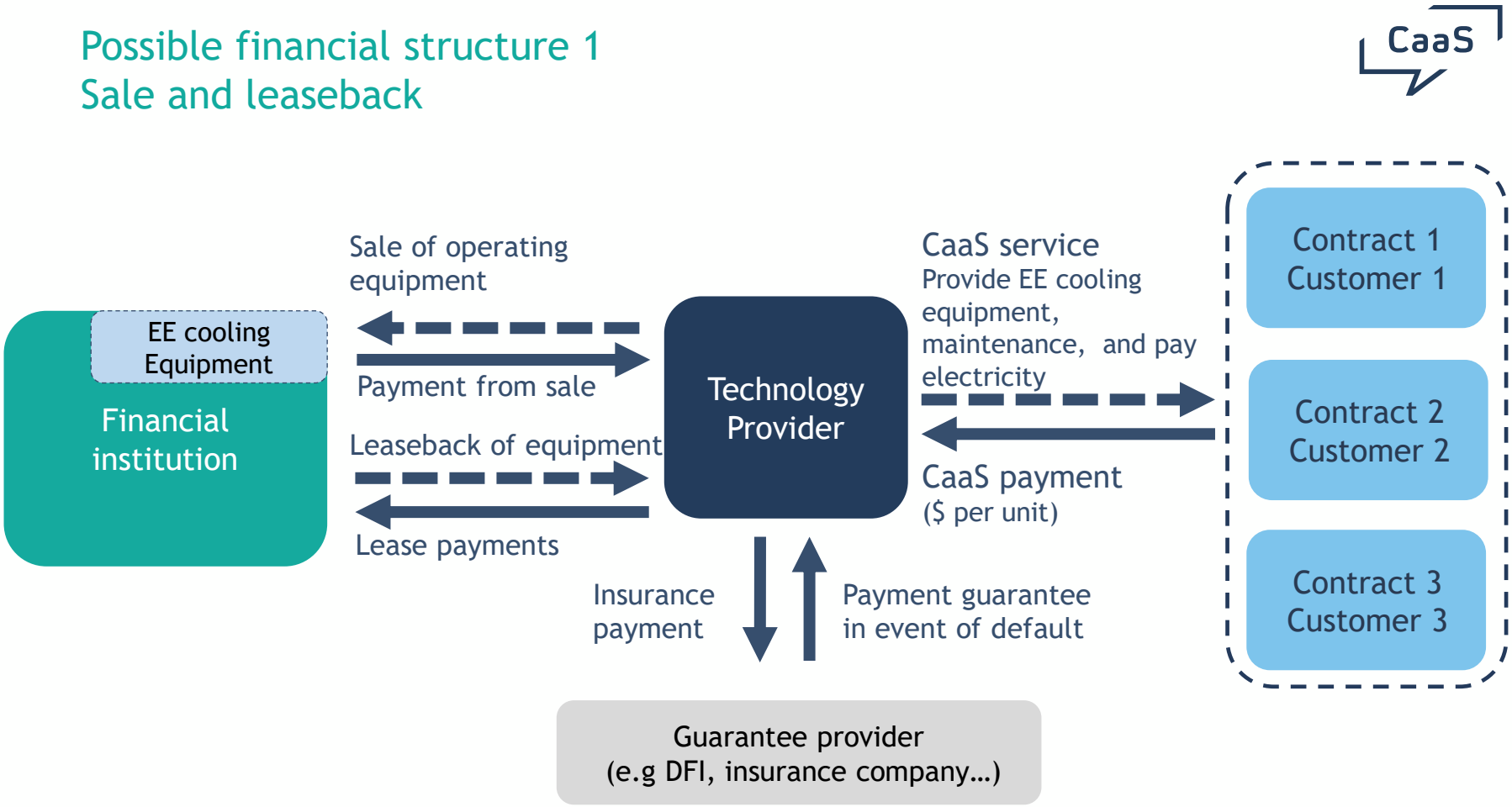
- Opportunity to place green funding
- Become front-runner to finance servitisation models (new trend)
- Investing in assets generating cashflows

CaaS

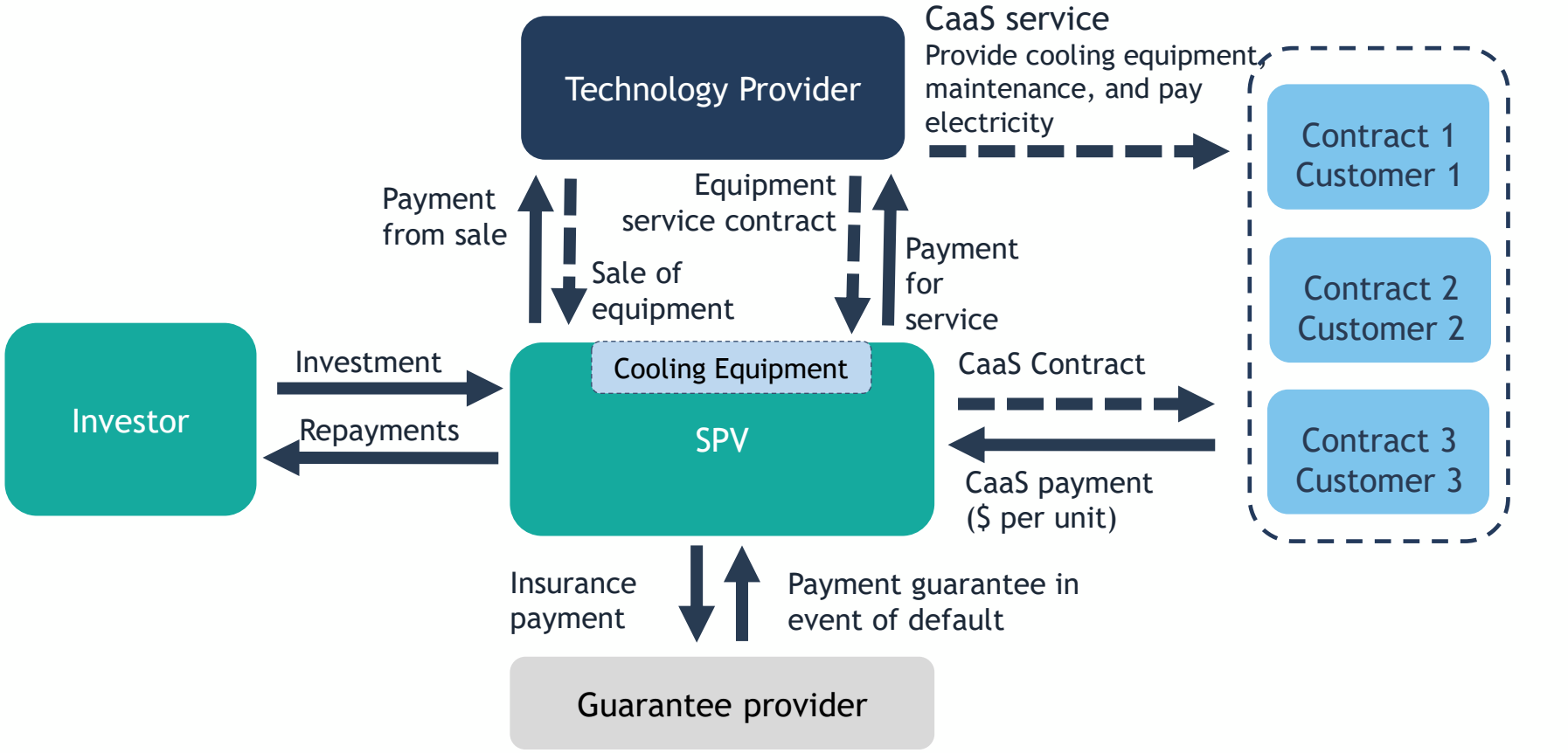
**Cooling as a Service**
Refresh the planet

# Funding structure

# Possible financial structure 1
# Sale and leaseback



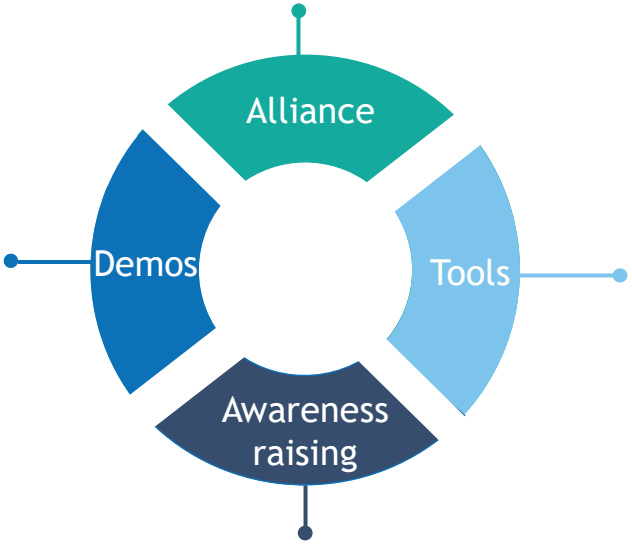
# Possible financial structure 2
# Special Purpose Vehicle (SPV)



CaaS

About

Partnerships with technology providers, clients, investors, associations, networks




Dominican Republic, Jamaica, Mexico, Argentina, Costa Rica, Grenada, Nigeria, South Africa, India

CaaS contracts, Pricing models, financial structures

Matchmaking events, workshops, webinars, articles, podcasts

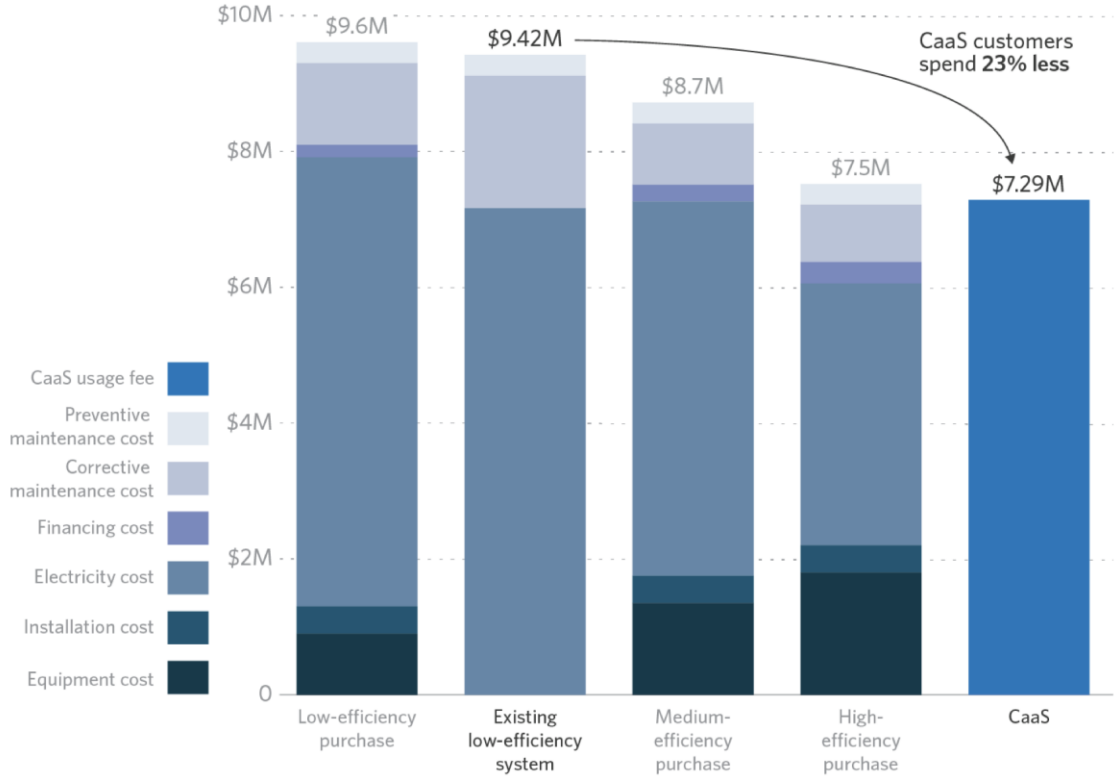
**More info:** *www.caas-initiative.org*

BASE

CaaS

Financial benefits

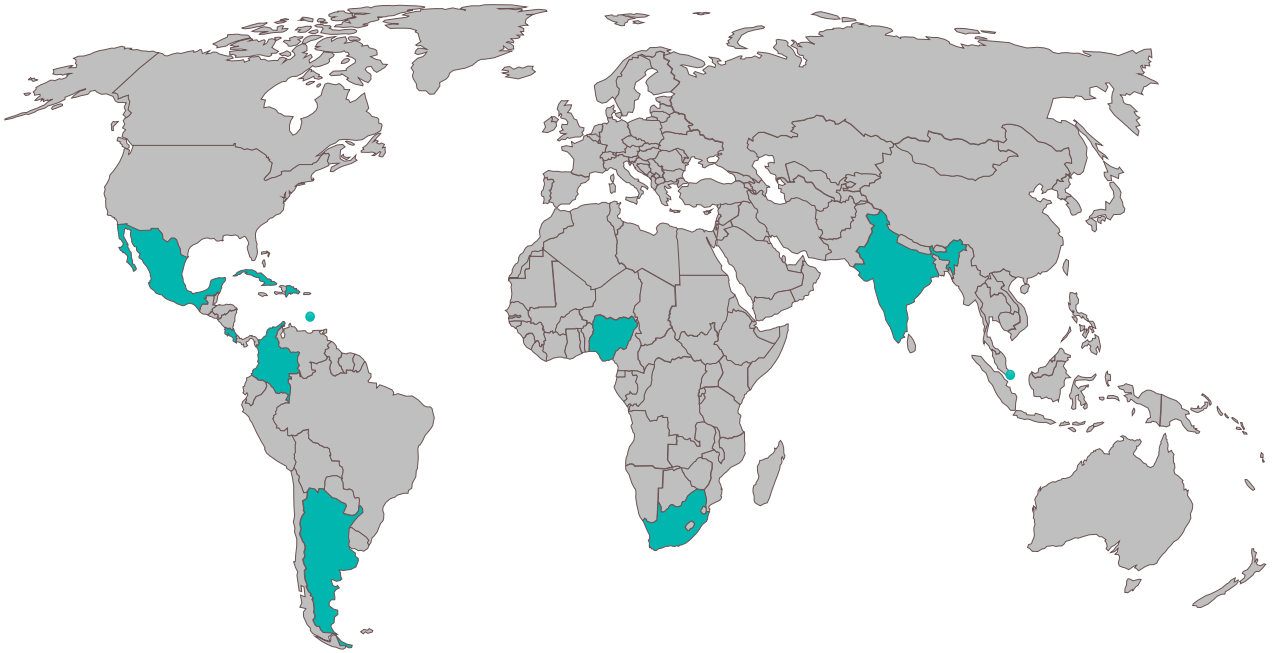
*Figure 3. Cumulative discounted customer spending for a 1200 TR chiller system*




**Cooling as a Service (CaaS), Lab Instrument Analysis,** *September 2019*

CaaS

# Implementation of CaaS



CaaS

Case Study

# CaaS for commercial building by MGM Innova Group in Medellin, Colombia

**Context:** New LEED certified building by Q-Group with 100 offices.

**Solution:** High efficiency 580TR magnetic bearing centrifugal chiller with valves to measure amount of cooling delivered to each user. Investment fully carried out by MGM; monthly payment billed to every office on a CaaS model. Common space bills are paid by building operator.

**Benefits:** Both client and final users enjoy a high-quality air-conditioning system, while focusing on their core-business and avoiding capital expenditures.

- Energy saving of 1,2GWh /year
- GHG emissions reductions of 440 tCO2e/year.

BASE

Alliance

# Join the alliance and register to the CaaS Newsletter

Gathers investors, banks, technology providers, networks and international organisations to:

- Implement the model in different sectors and regions.
- Spread the word about the model
- Build capacity
- Register to the CaaS Newsletter

CaaS

**Cooling as a Service**

Refresh the planet

Dimitris Karamitsos

Dimitris.karamitsos@energy-base.org

www.caas-initiative.org

BASE

*Driving investment in sustainable energy*

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02.

# Case study #2: Heating as a service

**Roxanne Pieterse, Research Manager, Heating Business Service, Delta-EE**

DELTA-EE

# HEAT AS A SERVICE

## DEFINITIONS, EXAMPLES AND OPPORTUNITIES

**CONTACT:**
**Roxanne Pieterse – roxanne.pieterse@delta-ee.com**

# About Delta-EE

**Delta-EE enables organisations to develop the best strategies, business models and customer propositions for the energy transition. Clients work with Delta-EE because of our unparalleled research base, which provides both breadth and depth of expertise, spanning:**

**'New Energy' Business Models**

Identify and understand the alternative and new business models for the energy transition

**EVs & Electricity**
Understand the opportunities and challenges from sector coupling between electricity and transport

**Flexibility & Energy Storage**
Take advantage of the opportunities emerging from an active demand side

**Heat**
How channel disruption, sector coupling and new technologies are changing the heat sector

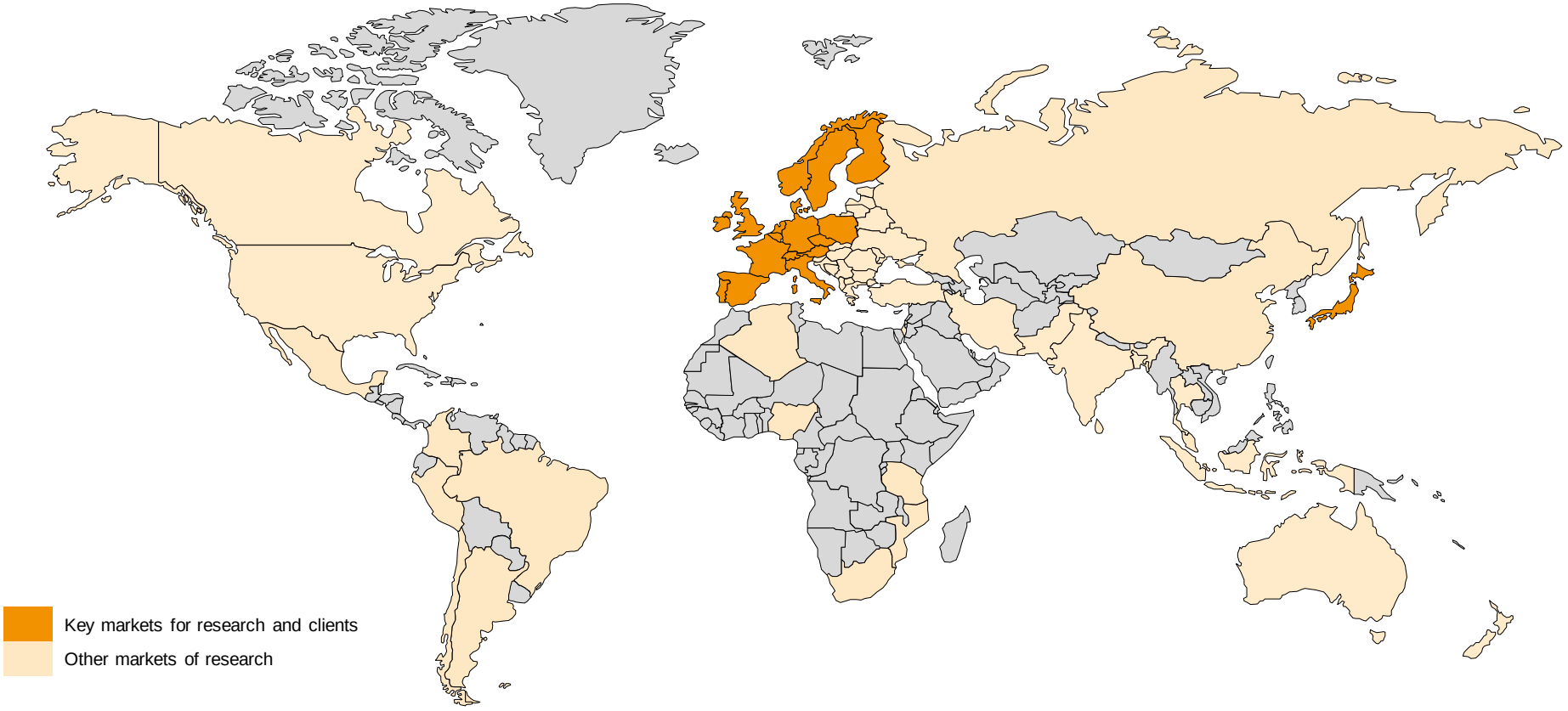
**Distributed Power**
Global market insight & expertise into the growing role of decentralised generation

**Digital Energy**
Opportunities in the connected home market and how digitalisation is changing the energy customer relationship

**Delta-EE provides:**

**Subscription Research Services** **Consultancy**

# Delta-EE's international presence and research




**Offices** in Edinburgh, London, Paris, Cambridge
**Remote workers** in Netherlands, Denmark, Japan, Australia

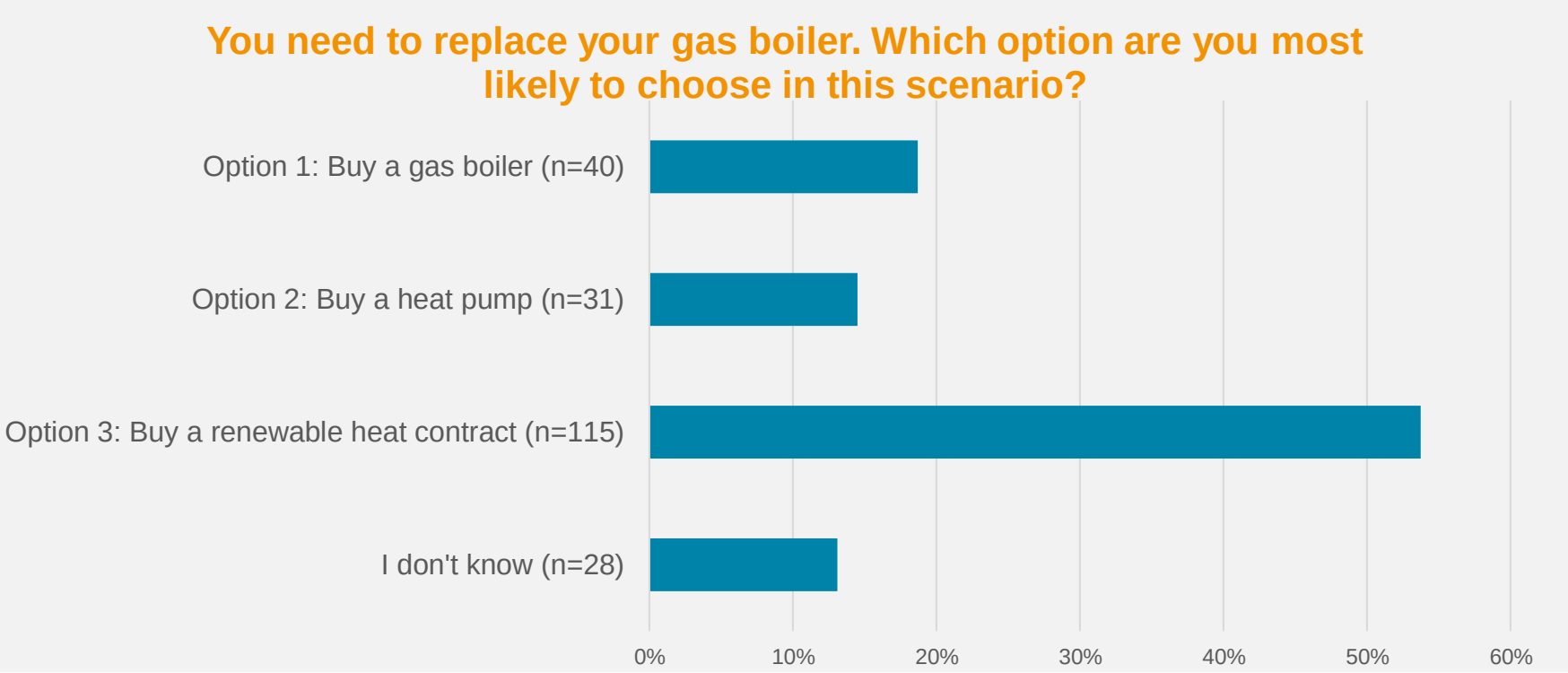
# A question for the audience:

**You've recently bought a house with an old, inefficient gas boiler. It'll need to be replaced in a few months time. You have the following options:**

| | Option 1: Buy a gas boiler | Option 2: Buy a heat pump | Option 3: A renewable heat contract |
|---|---|---|---|
| **Appliance:** | Gas boiler (own) | Heat pump (own) | Heat pump (rent) |
| **Supplier:** | Local installer | Local installer | Major energy retailer |
| **Upfront cost:** | €3,000 | €10,000 | €0 |
| **Monthly heating bill:** | €150 per month | €90 per month (~10 year payback) | €150 per month (contract includes energy supply to heat pump) |
| **Includes:** | | | |
| Installation | ✓ | ✓ | ✓ |
| Maintenance, repairs and replacement | ✗ | ✗ | ✓ |
| Remote monitoring and optimisation | ✗ | ✗ | ✓ |

# Answers from Delta-EE's webinar

## 214 responses



# What is heat as a service?

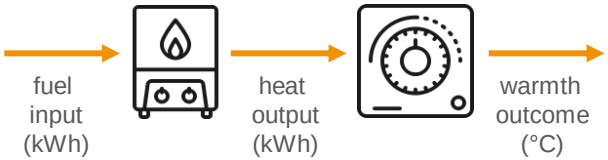
## New ways of paying for heating appliances and energy use

### THE HEATING EQUIPMENT

monthly payment rather than upfront through financing/rental agreement

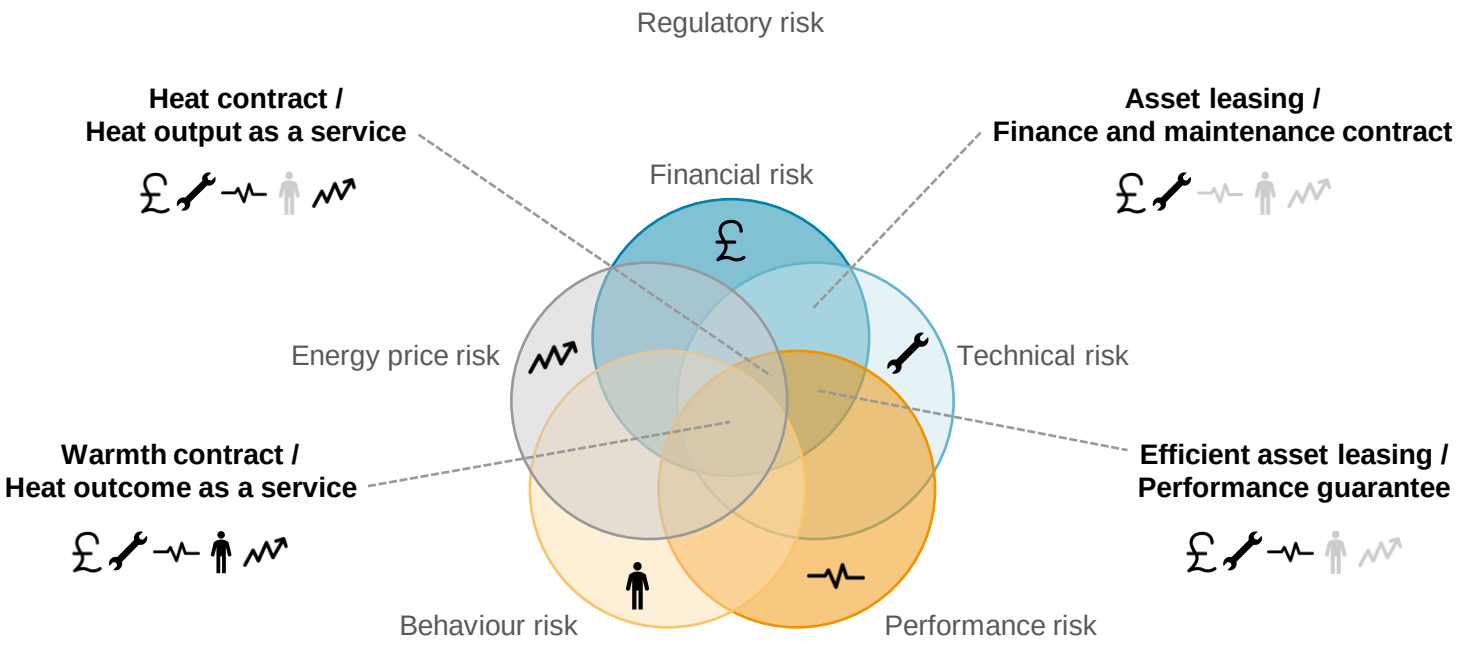
### THE ENERGY USE

selling outcomes rather than inputs



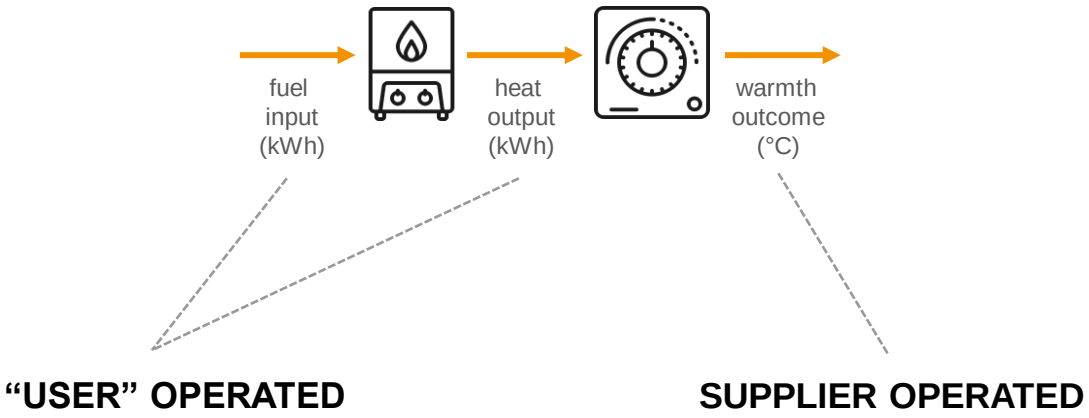
# What is heat as a service?

## Transferring risks from customers to service providers



# What is heat as a service?

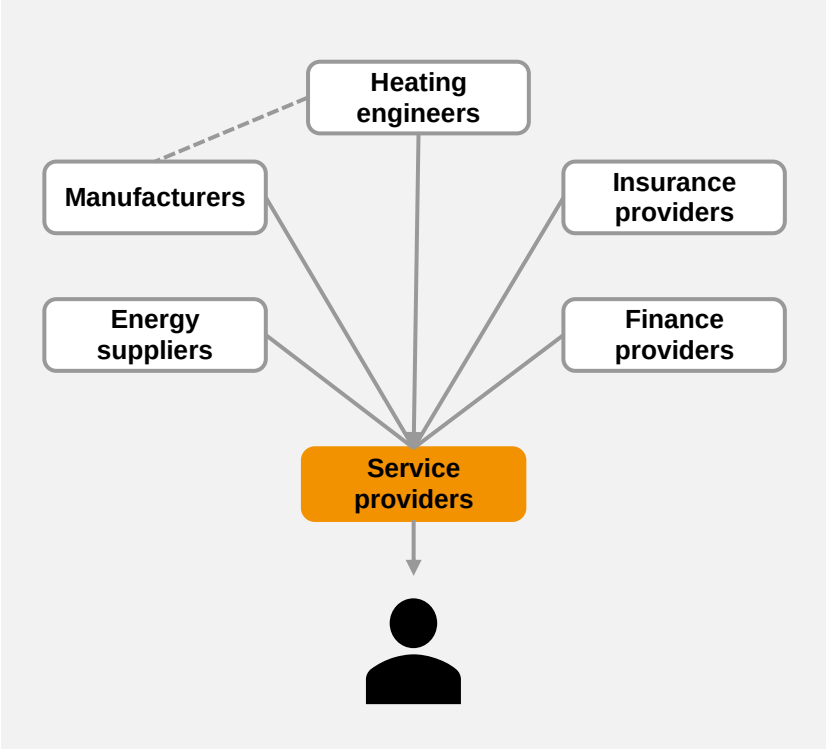
## Optimising energy within homes and the energy system



# What's behind the recent interest in HaaS?

**Some of the drivers and opportunities:**

1. **Everything-as-a-service**
2. **Energy customer loyalty / New routes to market**
3. **Connectivity and demand response**
4. **Decarbonising heat / Energy efficiency**
5. **Circular economy**



# “Rent heating” / “Heat contracting”

## E.ON, EWE, Innogy, Thermondo, Viessmann

**Location:**
Germany

**Equipment type:**
Gas boiler

**Equipment contract:**
Finance

**Energy supply contract:**
€ per kWh heat

**Equipment operation:**
User

**Contract length:**
10-15 years

**Risks:**

**Stage of development:**
Commercial
10,000s

| Gross cost per month | Eigenbetrieb | Warmth Basic | Heat flex | Warmth Green + |
|---|---|---|---|---|
| heating system | € 50 | ✓ | ✓ | ✓ |
| Full guarantee over 10 years | - | ✓ | ✓ | ✓ |
| maintenance | € 19 | ✓ | ✓ | ✓ |
| repair | € 8 | ✓ | ✓ | ✓ |
| chimney sweeper | € 3 | ✓ | ✓ | ✓ |
| interest payment | € 17 | ✓ | ✓ | ✓ |
| Monthly heating rent | € 97 | € 107 | € 114 | € 126 |
| Basic price for gas / heat | € 16 | - | ✓ | ✓ |
| Labor price for gas / heat | € 126 | - | ✓ | ✓ |
| Monthly energy costs | € 142 | - | € 101 | € 119 |
| Total monthly rate | € 239 | € 107 | € 215 | € 245 |

Source: Viessmann

# “e-Home Subscription / Membership”

## The FCTR E

**Location:**
Netherlands

**Equipment type:**
Heat pump + solar panels

**Equipment contract:**
Asset lease

**Energy supply contract:**
None (yet)

**Equipment operation:**
User

**Contract length:**
Indefinite

**Risks:**

**Stage of development:**
Commercial
1,000s


Source: The FCTR E

## Eneco

# “Comfort as a Service”

**Location:**
Netherlands

**Equipment type:**
Heat pump

**Equipment contract:**
Asset lease

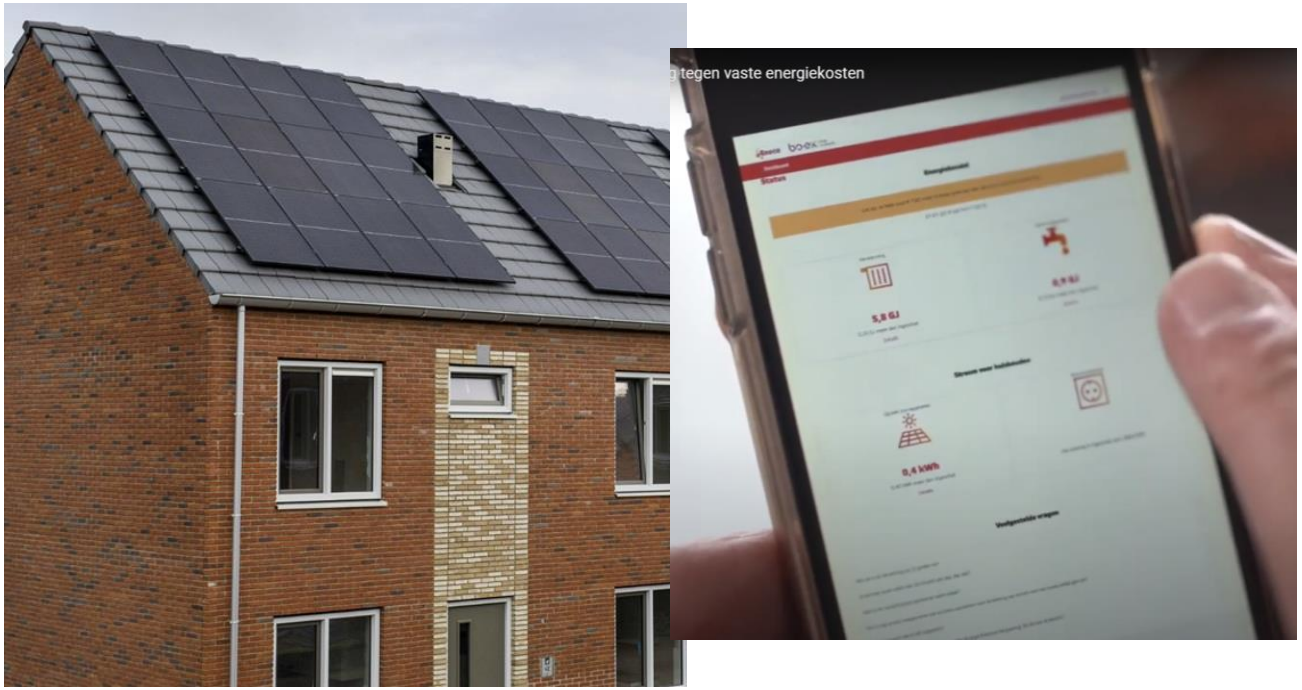
**Energy supply contract:**
Subscription (with limits)

**Equipment operation:**
Supplier

**Contract length:**
15 years

**Risks:**

**Stage of development:**
Trial – new build

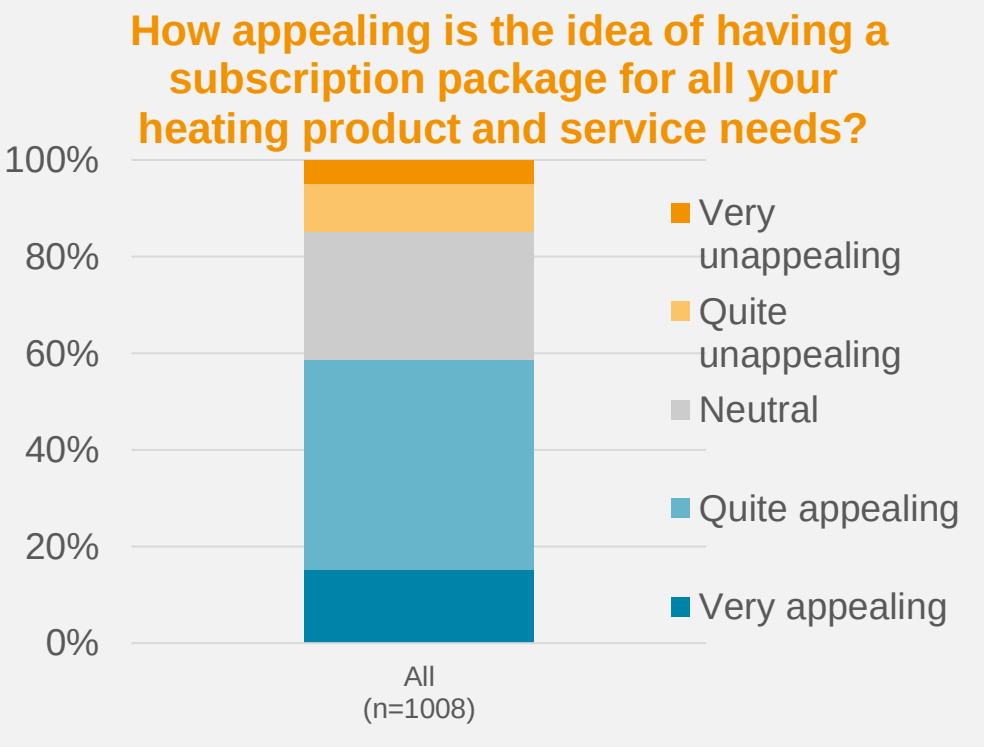



Source: Eneco

# Delta-EE's outlook for how the market will evolve

**Some of the barriers and challenges:**

1. **Value proposition**
2. **Silos / capabilities**
3. **Risk management strategies**
4. **Customer demand**
5. **Regulations**



# Delta-EE's outlook for how the market will evolve

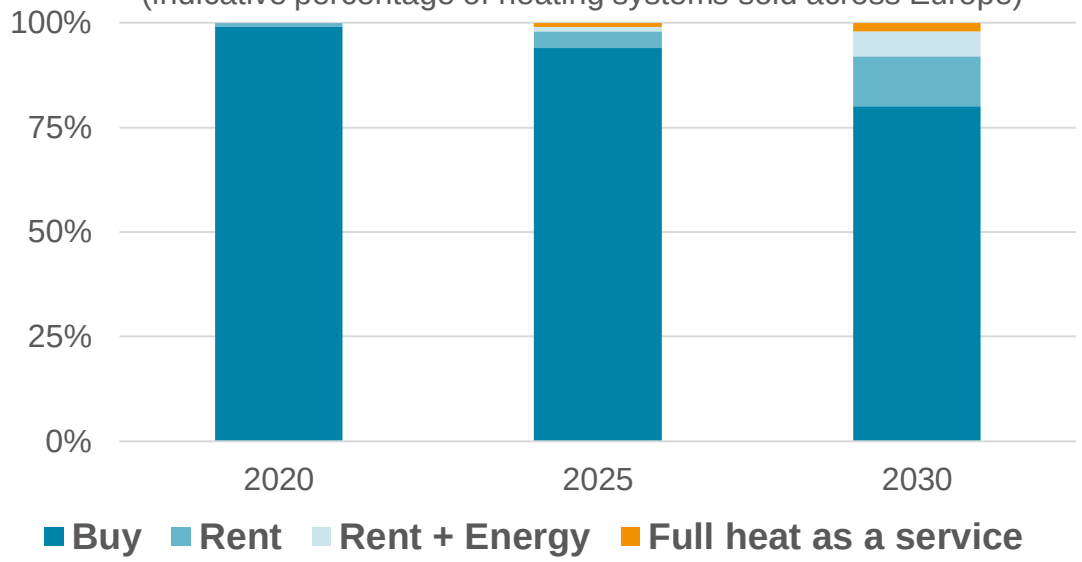
## A major part of the heating industry will become service orientated

**€ 20 Bn**

**The European heating replacement market**

**European market outlook for Heat as a Service**

(indicative percentage of heating systems sold across Europe)



# More on Heat as a Service from Delta-EE


**Series 1, Episode 3: Heat as a Service – selling comfort to the customer**

Guests: Engie & Energy Systems Catapult

**Series 2, Episode 4: Transforming homes with super-insulation and high-efficiency heating**

Guests: The FCTR E & Ecoworks

**Series 3, Episode 7: Home Energy Management: What is it and where's it headed?**

Guests: GreenCom Networks & PassivSystems

**Series 4, Episode 3: The world of heating controls: what's hot?**

Guests: Schneider Electric & Climote

DELTA-EE

# HEAT AS A SERVICE

## DEFINITIONS, EXAMPLES AND OPPORTUNITIES

**CONTACT:**
**Roxanne Pieterse – roxanne.pieterse@delta-ee.com**

03.

# Case study #3: Lighting as a service

**Thomas Leenders, Manager Public & Government Affairs Benelux, Signify**


Signify
Signify
Thomas Leenders
Manager Public & Government Affairs @Signify | Connecting and inspiring people | Doing business in a sustainable way |
Eindhoven, North Brabant Province, Netherlands
Add profile section
More...
Signify
Business School Notenboom
See contact info
See connections (500+)

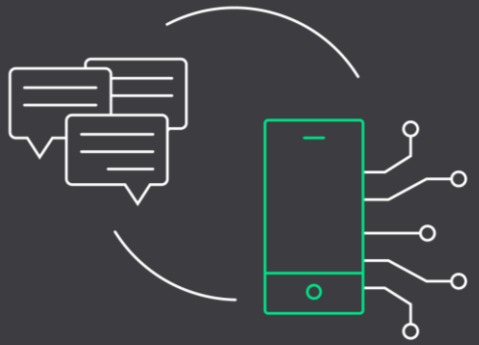
# Our world is changing - Global trends shaping our business

**Population growth**

more light

**Resource challenges**

more energy efficient light



**Digitalization**

more digital light

**Today, lighting accounts for 13% of the world's electricity demand. The global shift to LED will reduce this to 8% by 2030.**



signify

# Signify is the world leader in lighting

We provide high-quality energy efficient lighting products, systems and services

## Light sources

**No. 1**

Connected, LED, Conventional

## Luminaires

**€6.2bn**

sales in 2019,
~ 75% professional

## Systems and Services


**38,000**

people in 74 countries

**No. 1**

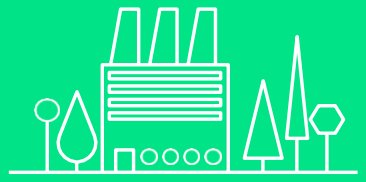
Industry Leader
Dow Jones Sustainability Index

Signify

# Brighter lives, better world

## Sustainable portfolio and operations

100% carbon neutral in 2020



**2017 - 2019**

#1 Industry leader, ‘Electrical Components and Equipment’ category, Dow Jones Sustainability Index

2019 “A” Rating by Carbon Disclosure Project for ‘Climate’ and ‘Supply Chain’

82.5% sustainable revenues (2020 target 80%)

94% electricity from renewables; carbon neutral in 15 markets

90% of industrial waste recycled

99% sustainable supply chain (2020 target 90%)

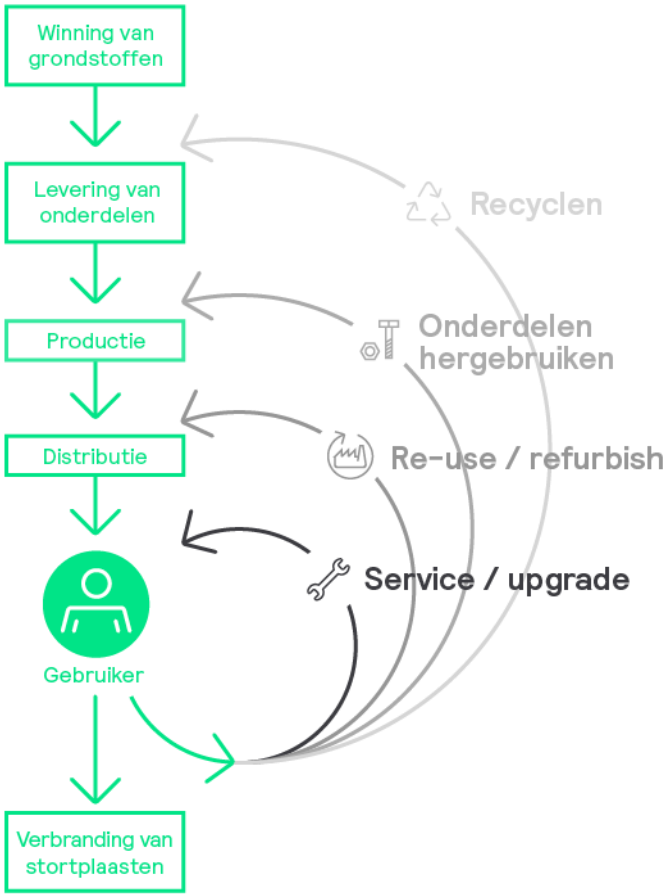


signify


Global Warming
signify

## What is a Circular Economy?

**A circular economy is an economical system which maximises the reusability of products and resources and minimises value distruction.**



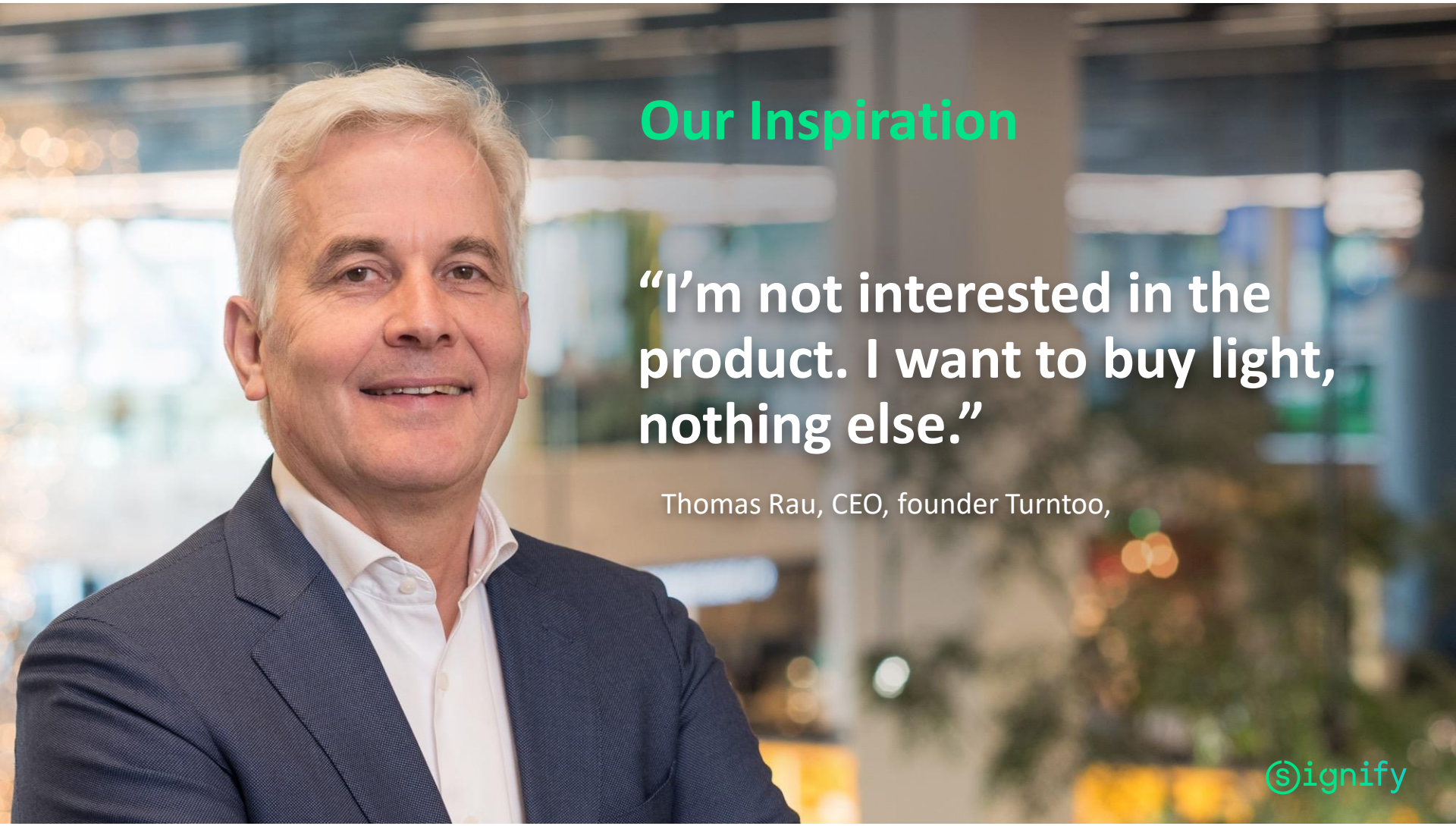

# The concept of circular economy

- **Maximasing the lifespan**, by optimal maintanance and high flexibility
- **Maximum value**, by enabling that products and parts can be re-used, refurbished and recycled

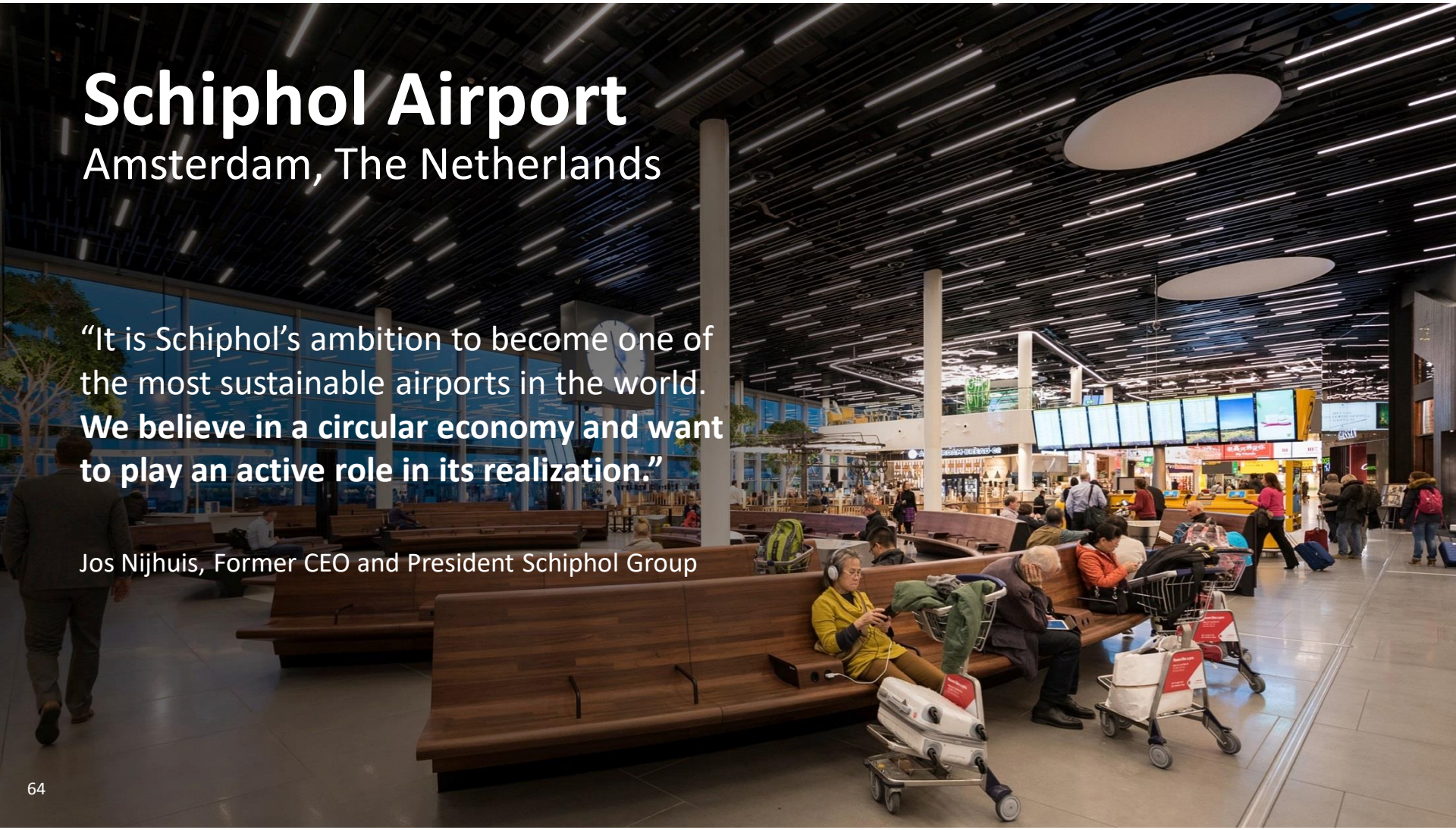
Signify

# Circular lighting

Signify


Our Inspiration
“I’m not interested in the product. I want to buy light, nothing else.”
Thomas Rau, CEO, founder Turntoo,
signify


Buy light, not lamps!
signify



# Schiphol Airport

## Amsterdam, The Netherlands

"It is Schiphol's ambition to become one of the most sustainable airports in the world. **We believe in a circular economy and want to play an active role in its realization."**

Jos Nijhuis, Former CEO and President Schiphol Group


PHILIPS
Luminaires can be
reused or recycled
With the return Philips wants to be able to re-use the materials,
the components, the luminaire or ultimately recycle it.

***Link***

# Our Instruments

**Design**

**New business-model**

**Reverse logistics**

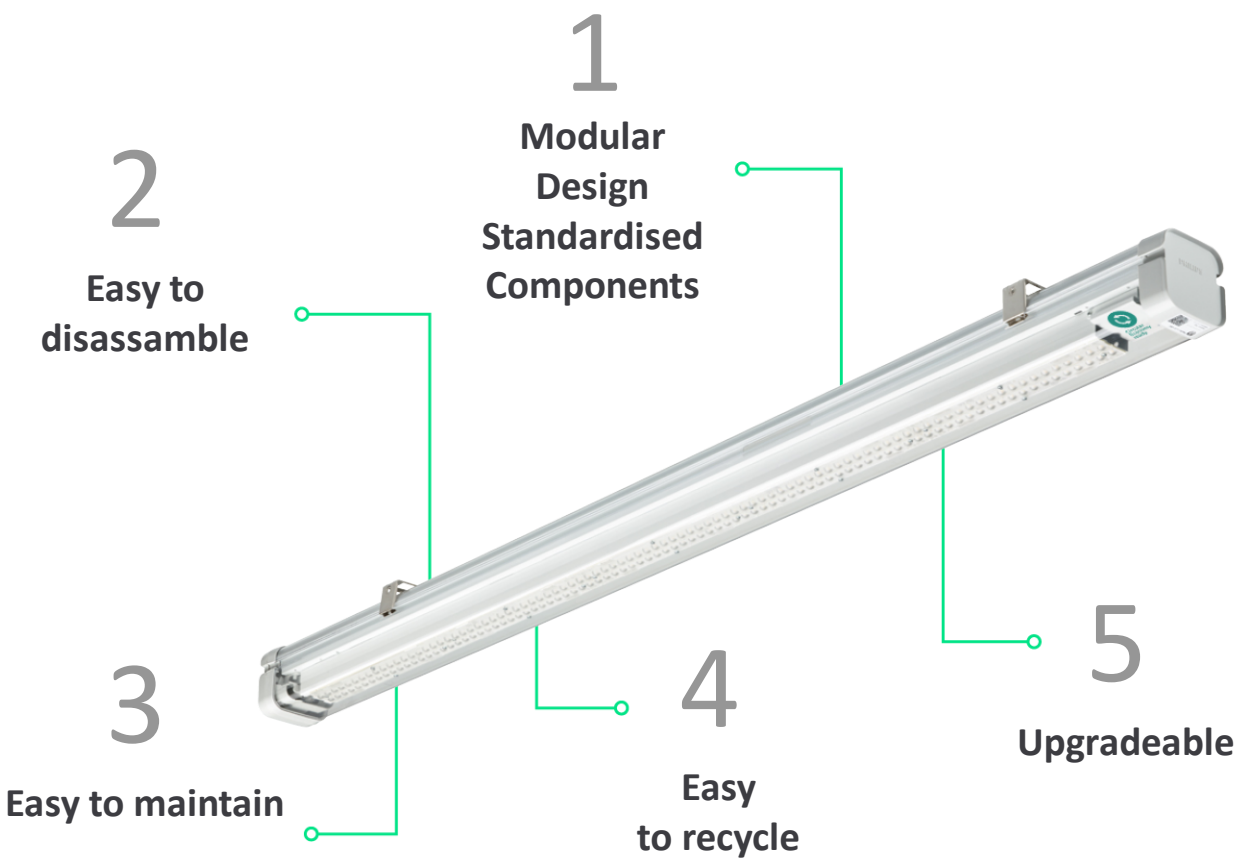
**Collaboration**

Signify

# Design

Design

# Pacific LED as an example of circular design




Signify

Design

# New technology: 3D printed luminaires

# New businessmodel

New businessmodel

# ‘End-to-end’ approach


signify

# Reverse logistics

# Reverse logistics


At the end of the contract

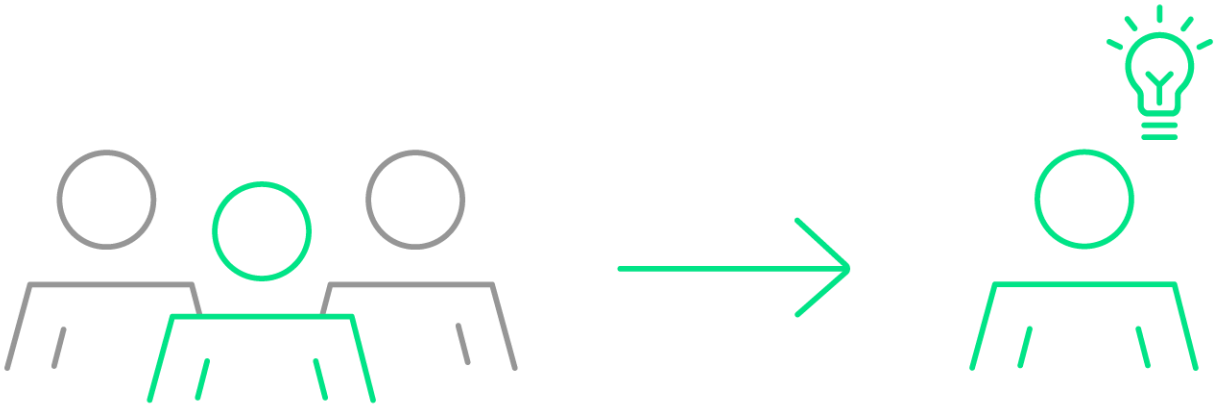
1. Refurbish
2. Collect Spare parts
3. Recycle
4. New installation, new contract

signify

# Collaboration

Collaboration

# Implement and maintain
## by reliable partners



Signify
Manufacturing, suppliers, installers, etc.

Customer

# And… It all begins
# with a transition to LED


signify

# Q&A session

# Closing remarks

**Andrea Voigt, EPEE**

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