

TRASH TALK

Co-Creation in the Danish Waste Sector

- Dylan Felty • Kyle Hanlon •
- Jean Philippe Miralda • Tyler Wilson •



DYLAN FELTY

B.S. CIVIL ENGINEERING

SYRACUSE, NEW YORK



WPI



Danish Waste Association

Waste is resources

KYLE HANLON

B.S. CHEMICAL ENGINEERING
MARLBOROUGH, MASSACHUSETTS





JEAN PHILIPPE MIRALDA

B.S. INDUSTRIAL ENGINEERING
TEGUCIGALPA, HONDURAS



WPI



Danish Waste Association

Waste is resources

TYLER WILSON

B.S. MECHANICAL ENGINEERING

DERRY, NEW HAMPSHIRE



GLOBAL PROJECTS PROGRAM

1ST YEAR

2ND YEAR

3RD YEAR

4TH YEAR



**INTERACTIVE
QUALIFYING PROJECT**
Study the Intersection Between
Science and Society



WPI



Dansk Affødsforening

Affald er ressourcer

Preliminary Research

JANUARY - MARCH

Field Research

MARCH - MAY



TRASH TALK

Co-Creation in the Danish Waste Sector



PROJECT INTRODUCTION



BACKGROUND RESEARCH



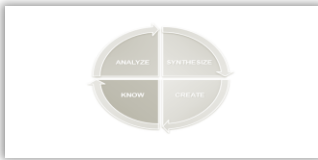
FIELD RESEARCH



CONCLUSIONS AND RECOMMENDATIONS



PROJECT INTRODUCTION



BACKGROUND RESEARCH



FIELD RESEARCH



CONCLUSIONS AND RECOMMENDATIONS

The Circular Economy Model challenges the ways society treats their waste and their resources.



CIRCULAR ECONOMY MODEL

Adopted by the EU in December 2015 through the Circular Economy Action Plan.

Waste management is most effective when both waste generators and waste processors participate.



7 RESIDENTIAL WASTE FRACTIONS



PLASTIC



GLASS



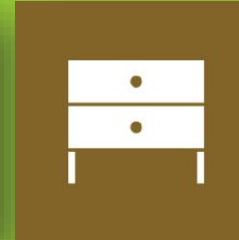
METAL



CARDBOARD



PAPER



WOOD

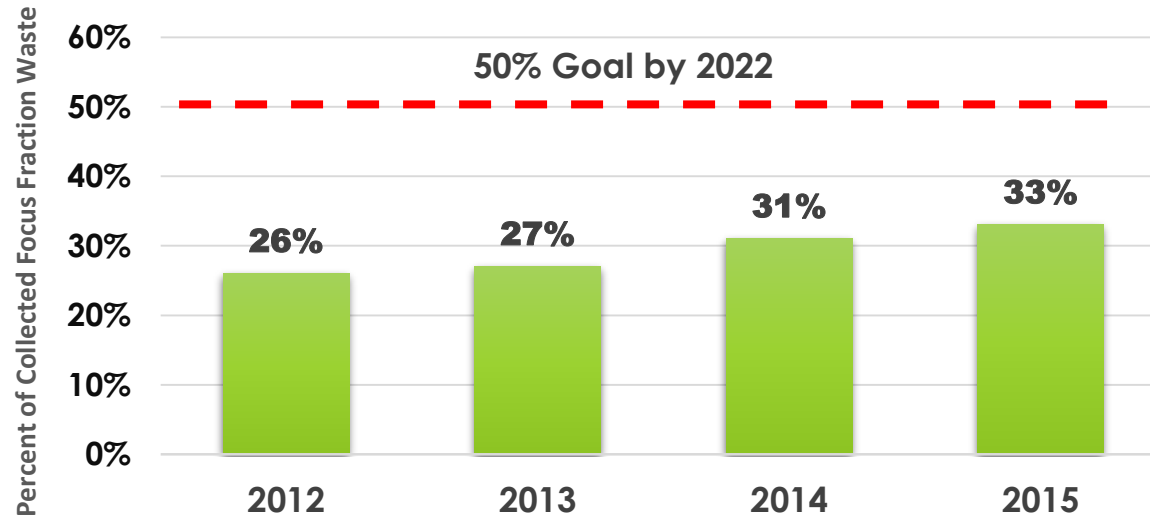


ORGANIC



The Danish Waste Sector still has room for improvement with residential waste collection.

Percent of 7 Focus Fractions Collected at a Residential Level





15 SUGGESTIONS FOR A MORE CIRCULAR ECONOMY

*“1. Strengthen
citizen participation
through sharing of
best practices”*

OUR PROJECT



The goal of our project was to identify co-creative practices that incorporate citizens in the design of a waste system that meets the preferences of both waste companies and citizens in Denmark.



PROJECT INTRODUCTION



BACKGROUND RESEARCH



FIELD RESEARCH

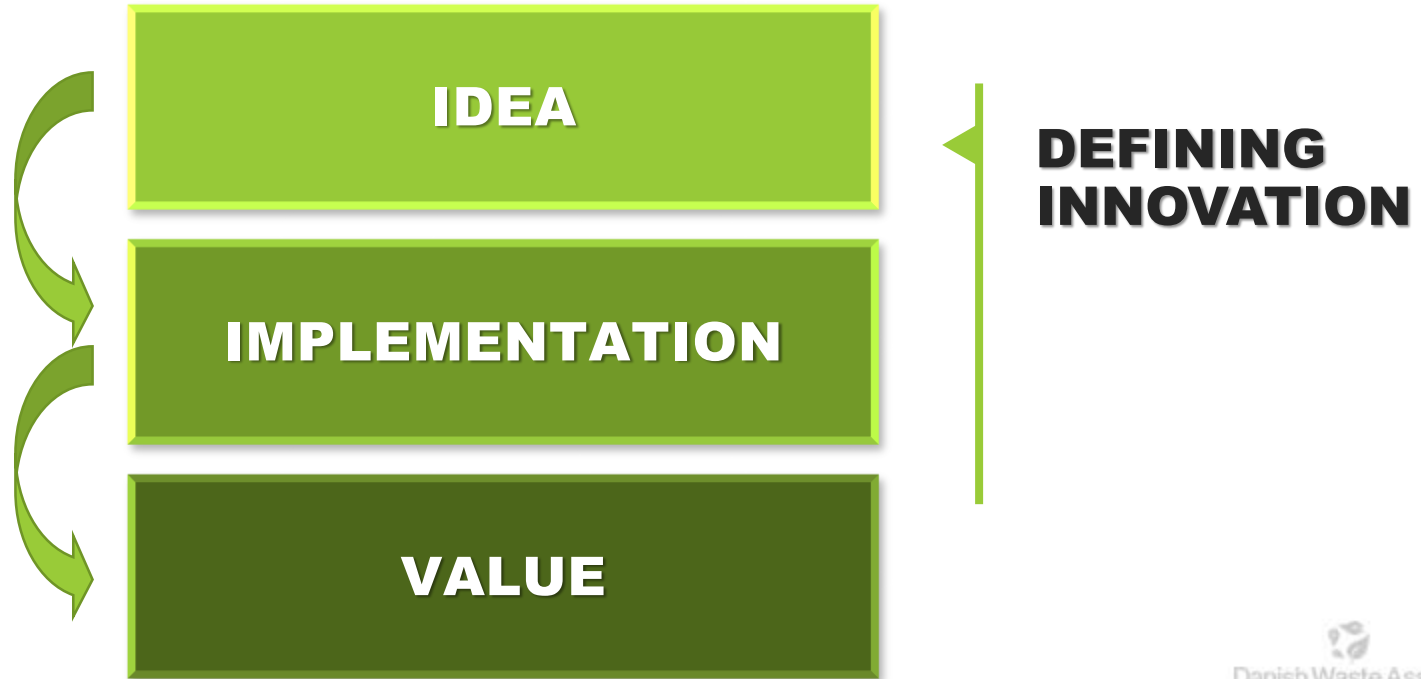


CONCLUSIONS AND RECOMMENDATIONS

CO- CREATION



Co-Creation is about innovation: Implementing ideas to create value.



Value is defined differently in public and private enterprises.

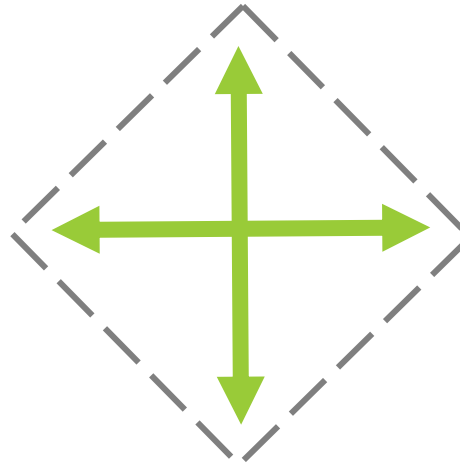
4 BOTTOM LINES OF PUBLIC VALUE

Bason (2010)



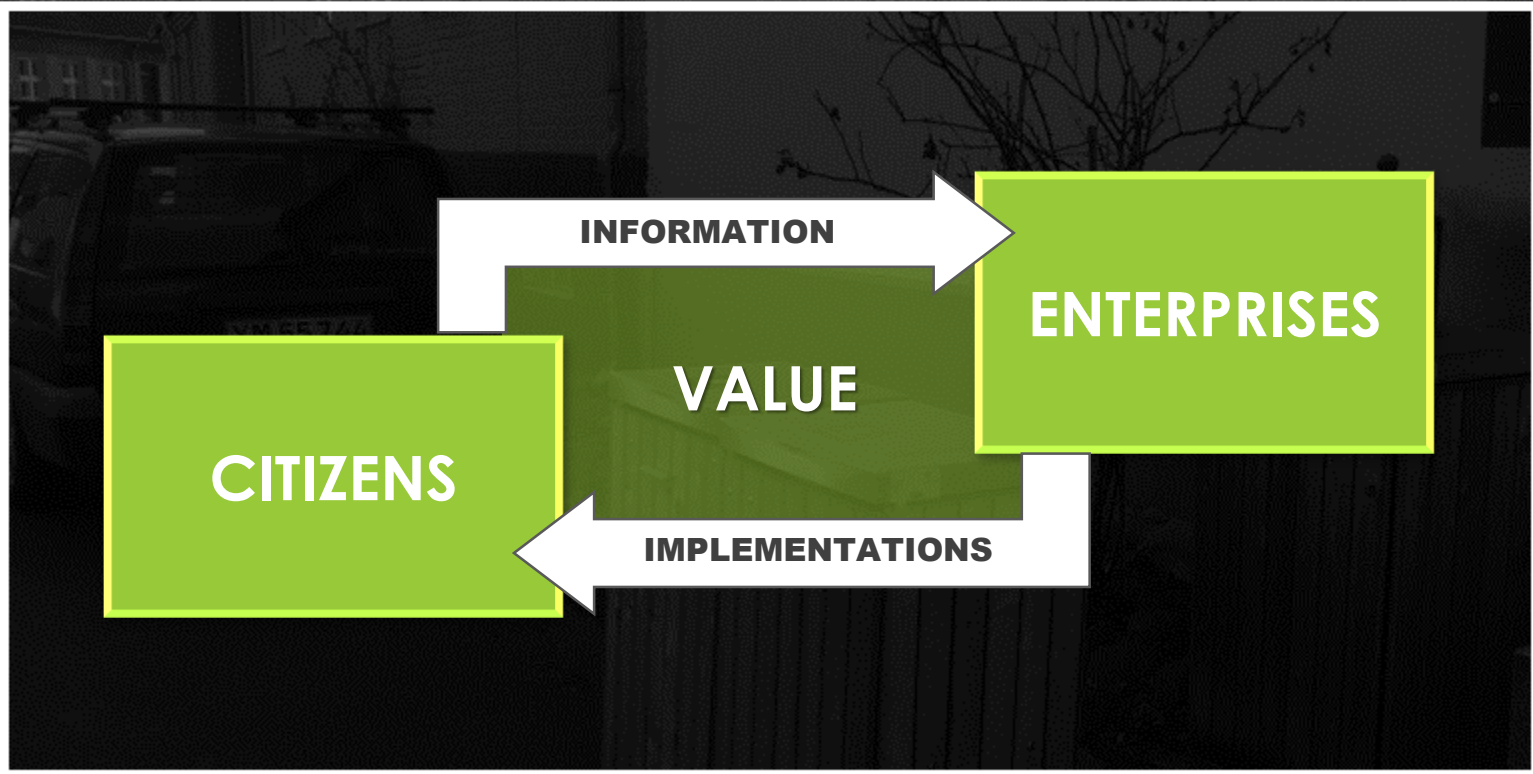
PRODUCTIVITY

**USER
EXPERIENCE**



RESULTS

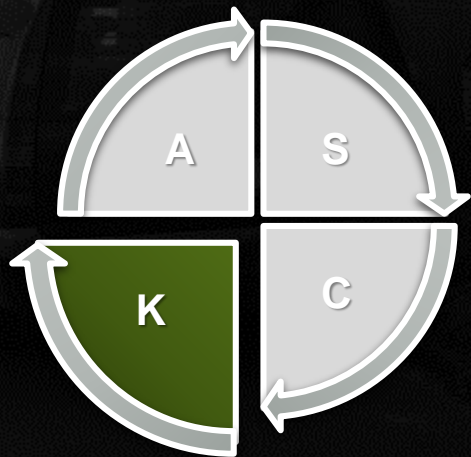
DEMOCRACY



THE PROCESS

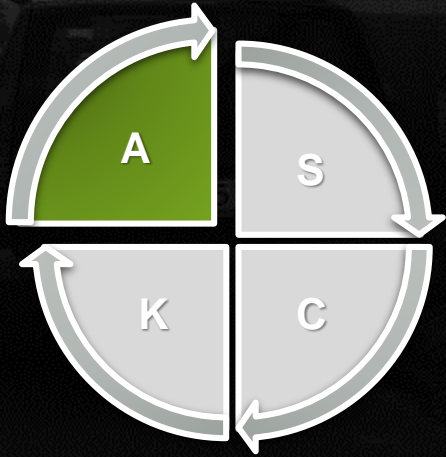
BASON (2010)





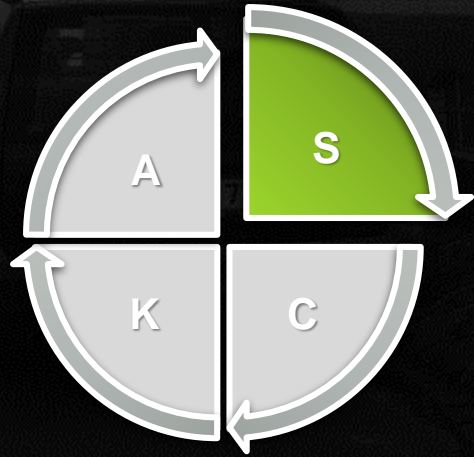
KNOWING

BASON (2010)



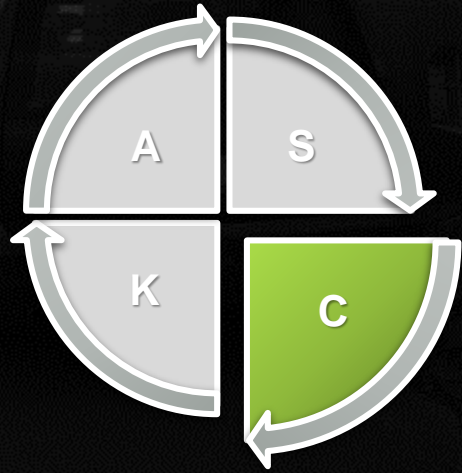
ANALYZING

BASON (2010)



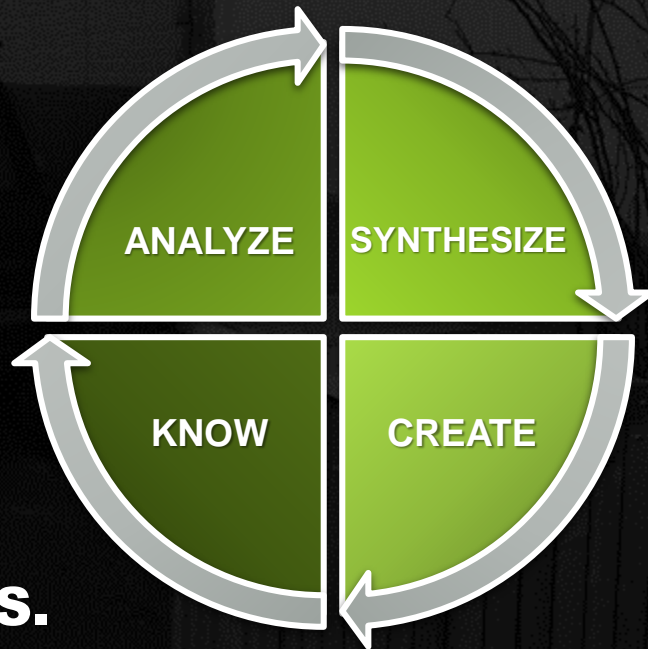
SYNTHESIZING

BASON (2010)



CREATING

BASON (2010)



THE PROCESS.

BASON (2010)



PUBLIC ENGAGEMENT



Photo Credit: Tim Gouw

CO-CREATIVE ROLES

NAMBISAN & NAMBISAN (2013)



EXPLORER



IDEATOR



DESIGNER



DIFFUSER



8 APPROACHES TO PUBLIC ENGAGEMENT

ADAPTED FROM ENGAGE2020 (2014) AND WORLD BANK (2018)

ONE-WAY APPROACHES

CONSULTING

GRIEVANCES

DIRECT DECISION

**CITIZEN-LED
MONITORING**

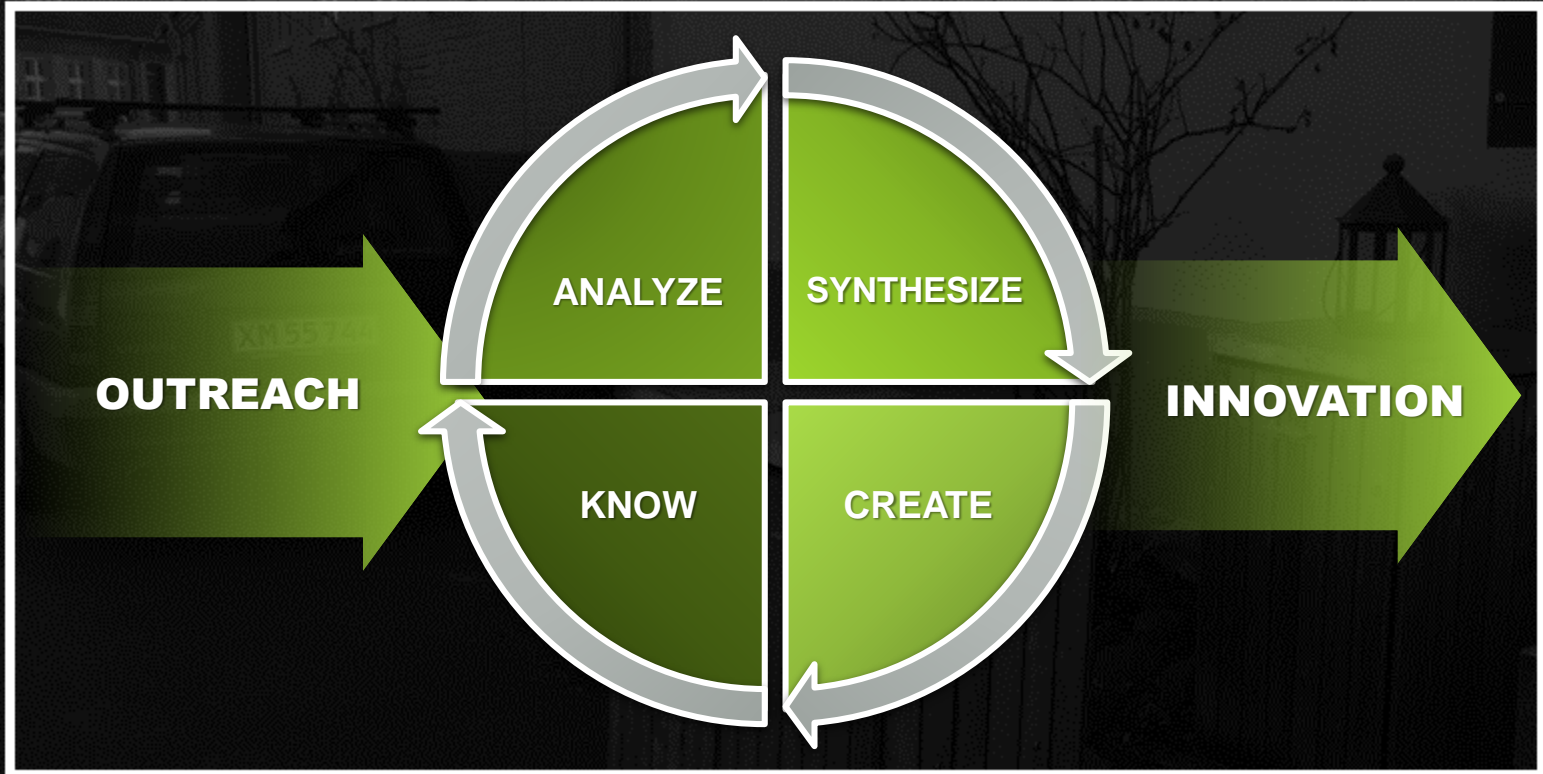
TWO-WAY APPROACHES

DIALOG

COLLABORATING

INVOLVING

EMPOWERING





PROJECT INTRODUCTION



BACKGROUND RESEARCH



FIELD RESEARCH



CONCLUSIONS AND RECOMMENDATIONS

PROJECT METHODOLOGY



OBJECTIVE 1

EVALUATE PUBLIC ENGAGEMENT METHODS

OBJECTIVE 2

IDENTIFY WAYS TO INCREASE CO-CREATION

OBJECTIVE 3

IDENTIFY CHALLENGES TO IMPLEMENTING CO-CREATION

**QUALITATIVE
DATA
GATHERING**

FIELD VISITS

PERSONAL INTERVIEWS

ONLINE RESEARCH

We met with:

5

**WASTE COMPANY
REPRESENTATIVES**

1

CITIZEN AMBASSADOR

8

**INTERDISCIPLINARY
SPECIALISTS**

3

**WASTE MARKETING
CONSULTANTS**

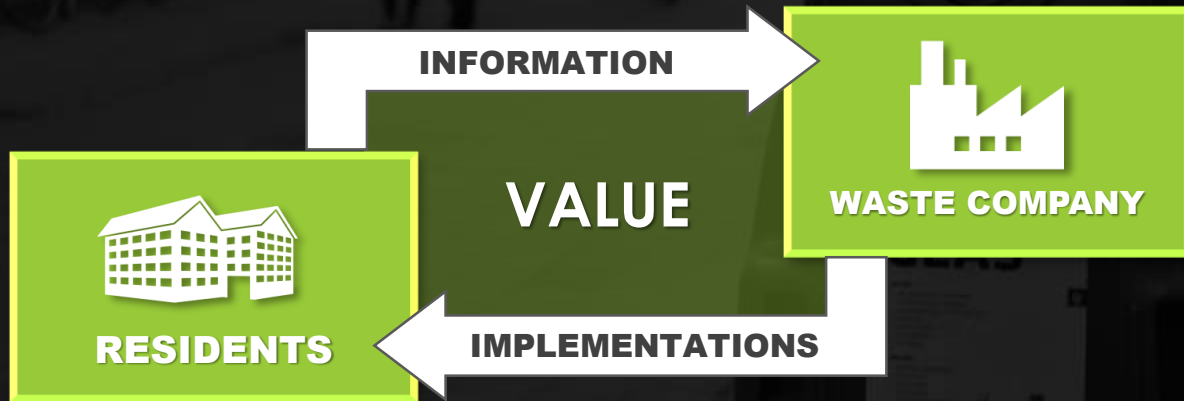
1

**UTILITIES COMPANY
REPRESENTATIVE**

2

**PRIVATE COMPANY
REPRESENTATIVES**

RESEARCH SPACE





OUTREACH

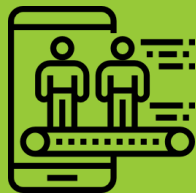
**CITIZEN
INVOLVEMENT**

**COLLABORATION
OUTSIDE WASTE**

OUR FINDINGS



OUTREACH



**DIGITAL
PLATFORMS**

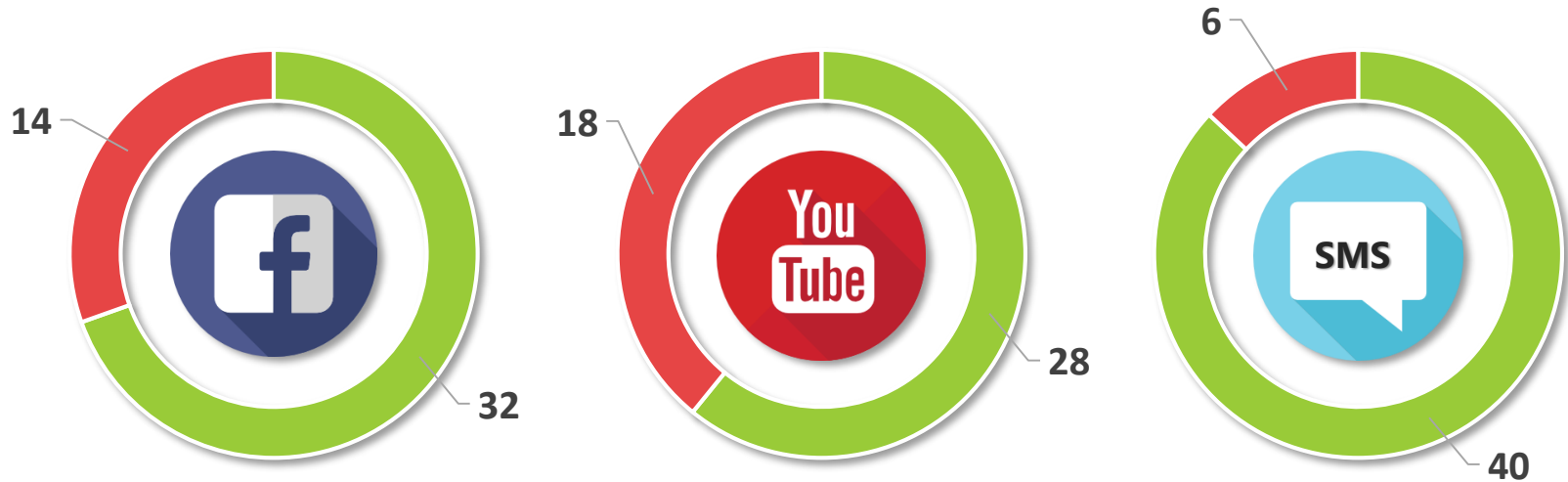


**PERSONAL
INTERACTION**



EDUCATION

We analyzed the Digital Outreach platforms used by 46 of the DWA Members:





Fors A/S

March 20 at 3:48pm · 🌐

Do you have a good and useful tip about water? 💧👍 Share it with us. We premiere the best tip with a Fors drinking 💧, which you can fill with nice Danish drinking water 😊

** This competition is neither sponsored, supported nor administered by or associated with Facebook. When giving permissions and information, these are given to Fors A / S, not to Facebook. We will contact the winner in the comment thread. The winner and winner tip will be published on our Facebook page Tuesday, April 3, 2018. **

See Translation



Like



Comment



Share



CITIZENS SHARE TIPS



Effektiv forsyning,
til for dig



INVITE CITIZENS TO BECOME AMBASSADORS



Effektiv forsyning,
til for dig

Fors A/S
March 6 · 🌐

Become an ambassador for the good customer experience in Fors A / S. 😊
As a customer ambassador, you will have a unique opportunity to put your attention to the experience we create in Fors A / S for our customers. Is this something for you? 🙌 😊 Then read more and sign up here:
www.fors.dk/kundeambassadoer 🌐

See Translation

Kom og vær med

Fors-ambassadør

👍 Like 💬 Comment ➦ Share

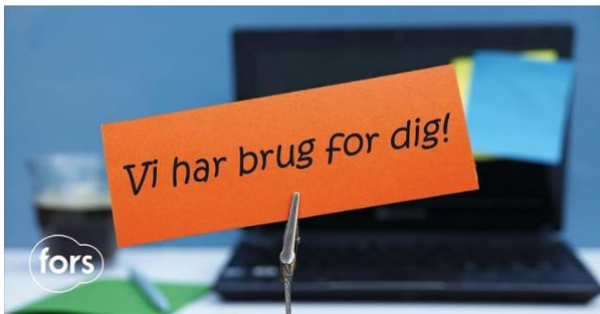




Fors A/S

February 19 · 🌐

Do you live near one of the places where our digging work has been on for a long time? 🚧🚧 We would like to hear from you 😊
We are currently investigating how we can improve our customer experience. Therefore, we are now looking for one person who wants to participate in a telephone interview 🗣️
It is about 30 minutes and as a thank you for two cinema tickets. 🎟️
Interview will be made on 22, 23, 26. or 27 February in the daytime.
Write in the comments box if you have the time and want to join 👤👤 Then we send a private message with a closer time to the first one to report 😊
See Translation



👍 Like

💬 Comment

➦ Share



REQUEST CITIZEN INTERVIEWS



Effektiv forsyning,
til for dig



DIRECT REPLY TO CUSTOMER COMMENTS



**GLOSTRUP
FORSYNING**

Ehlers Rasmussen Lotte · **Glostrup Forsyning** · 1. september 2017 · 🌐

Vil SÅ gerne have tømt min dagrenovation inden weekend 😞

1 kommentar

👍 Synes godt om 🗨 Kommenter 🔄 Del 💬 Besked 🌐

Kronologisk ▾

Glostrup Forsyning Hej Lotte. Jeg kan se, at du først lige har meldt manglende tømning her kl. 12:52 i dag. Det betyder, at renovatoren tidligst kan hente det mandag. Jeg kan desuden se, at du har tømningsdag om onsdagen. Derfor vil jeg opfordre dig til at du melder det samme aften, da renovatoren derfor har lettere ved at nå at tømme det glemte inden weekenden. God weekend.

Synes godt om · Svar · Kommenteret af Sofie Lauritsen [?] · 28 u

Ehlers Rasmussen Lotte Nej jeg meldte det også igår formiddags

Synes godt om · Svar · 28 u · 1

Ehlers Rasmussen Lotte Det svært hvis ikke man er der onsdag aften og opdager det torsdag 😞 meldte det så snart jeg så det igår formiddags. Sur røv igen

Synes godt om · Svar · 28 u



Glostrup Forsyning
 Offentliggjort af Sofie Lauritsen [?] · 20. september 2017 · €

Her kan du læse meget mere om samarbejdet med Kopenhagen Fur 😊
<https://www.glostrupforsyning.dk/.../kopenhagen-fur-sender-g.../>



Kopenhagen Fur sender genbrugsvarme ud til parcelhuse

Kopenhagen Fur og Glostrup Forsyning har indgået en aftale omkring varmen fra Kopenhagen Furs køleanlæg. Derfor bliver varmen nu
 GLOSTRUPFORSYNING DK

- C Glostrup Forsyning** Ja anlægget fylder ikke mere end du ser i indslaget, da køleanlægget som danner overskudsvarmen står hos Kopenhagen Fur. Du er stadig velkommen til at kontakte os, hvis du ønsker en rundvisning. Som vi skriver i artiklen, producerer anlægget 24.000 GJ svarende til 1000 parcelhuse. Vi leverer også fjernvarme til parcelhuse, men vores kunder er primært storkunder. Fortsæt god dag.
- Synes godt om · Svar · Kommenteret af Sofie Lauritsen [?] · 25 u
- Torben Jensen** Ok men i artiklen står der følgende: På den måde kan al den varme, der bliver i overskud Kopenhagen Fur, blive sendt via kommunens forsyningsanlæg og altså tage turen videre ud i varmeapparatene ude i 1000 parcelhuse i Glostrup Kommune... Det er altså det man kalder en alternativ sandhed eller ??
- Synes godt om · Svar · Besked · 25 u
- C Glostrup Forsyning** Som det fremgår i vores artikel på hjemmesiden, og som vi har delt her via Facebook, sender vi overskudsvarmen fra anlægget ud til vores fjernvarmekunder. Anlægget leverer ca. 24.000 GJ svarende til ca. 1.000 parcelhuse. I artiklen på Lorry som du henviser til, kan man få det indtryk at det er specifikke 1.000 parcelhuse, det er ikke korrekt. Der er tale om en varmemængde svarende til 1.000 parcelhuse.
- Synes godt om · Svar · Kommenteret af Sofie Lauritsen [?] · 25 u

SCREENING CONTACTS



**GLOSTRUP
 FORSYNING**



KEEP CITIZENS INFORMED



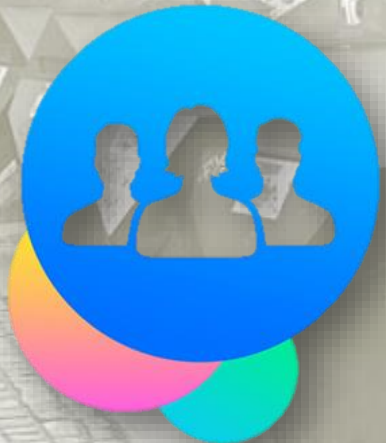
**GLOSTRUP
FORSYNING**

Glostrup must have new genbrugsstation. The glostrup In the meantime, you can use other genbrugsstationer in the catchment area of the vestforbrændings. Learn more about what's going to happen and what you can do in the meantime 😊

<https://www.glostrupforsyning.dk/affald/genbrugsstation/ny-genbrugsstation/>

⚙️ Rate this translation





**FACEBOOK
GROUPS**

STARTING PILOT PROGRAMS



**GLOSTRUP
FORSYNING**





“Having a Facebook page allows us to offer support to our customers almost 24/7, and ‘stay open’ on weekends”





**STINNE STOKKEBO
ARWOS**

HUMOROUS VIDEO SERIES



Favrskov
FORSYNING



 <p>0:55</p>	 <p>1:37</p>	 <p>1:51</p>	 <p>2:31</p>
<p>Sortér Med Manér - Kor 187 views • 10 months ago</p>	<p>Sortér med manér - Episode 3 437 views • 11 months ago</p>	<p>Sortér med manér - Episode 2 567 views • 11 months ago</p>	<p>Sortér med manér - Episode 1 1.6K views • 1 year ago CC</p>



EDUCATIONAL VIDEOS



GLOSTRUP
FORSYNING



CITIZENS SHARE BEST PRACTICES



**GLOSTRUP
FORSYNING**



**Erfaring med affaldssortering
Kaleb Knappmann Glostrup**

103 views • 2 years ago



**Erfaring med affaldssortering
Dorthe Bylstrup Glostrup**

114 views • 2 years ago



**Erfaringer med
affaldssortering Stina Letvad**

120 views • 2 years ago



**Erfaring med affaldssortering
Niels Johnsen Glostrup**

101 views • 2 years ago





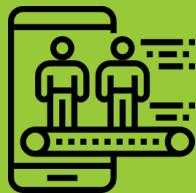
VIDEO CHALLENGES



VESTFORBRÆNDING



OUTREACH



**DIGITAL
PLATFORMS**



**PERSONAL
INTERACTION**



EDUCATION

Companies participate in Cultural Nights & Annual Festivals to engage in dialogue with customers.



**VIRTUAL REALITY
TOUR OF SORTING
STATION AT
CULTURAL NIGHT**



**INTERACTIVE
DISPLAYS AT
ANNUAL FESTIVAL**

The Green Embassy is a space set up by the Aarhus Kommune to interact with citizens.



AARHUS
KOMMUNE





With the help of Katzen-Mark, Roskilde Kommune set up portable sorting stations.



ROSKILDE
KOMMUNE

KATZEN-
MARK 

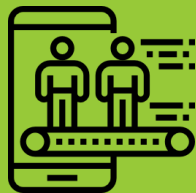




“We believe it is very important to meet citizens where they are at”

**LONE MISFELDT
KATZEN - MARK**

OUTREACH



**DIGITAL
PLATFORMS**



**PERSONAL
INTERACTION**



EDUCATION



VESTFORBRÆNDING

**11 STAFF MEMBERS FOR
EDUCATIONAL OUTREACH**

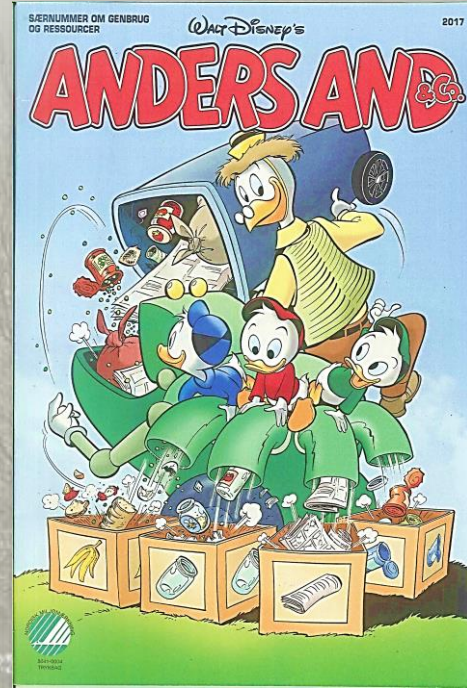
**300 SCHOOLS AND
25,000+ VISITORS PER YEAR**

4 DIFFERENT EDUCATION LABS





VESTFORBRÆNDING



RENO DJURS

**Landfill Site
Teaching Lab**



Vestforbrænding has worked with academic co-design projects in the past.

kea
KØBENHAVNS ERHVERVSAKADEMI



Design, Sustainability and Waste Management Program (2012)

- 130 students participated
- 6 different programs
- 27 project proposals

“A few years ago we made an innovation strategy, zero ideas actually happened”

**HENRIK M. DAALGARD
VESTFORBRAENDING**



INVOLVING CITIZENS



Katzen-Mark worked with a Building Manager at the Tingbjerg Forum to improve sorting.

Tingbjerg has 2,000 apartments with more than 6,000 residents representing 82 nationalities.

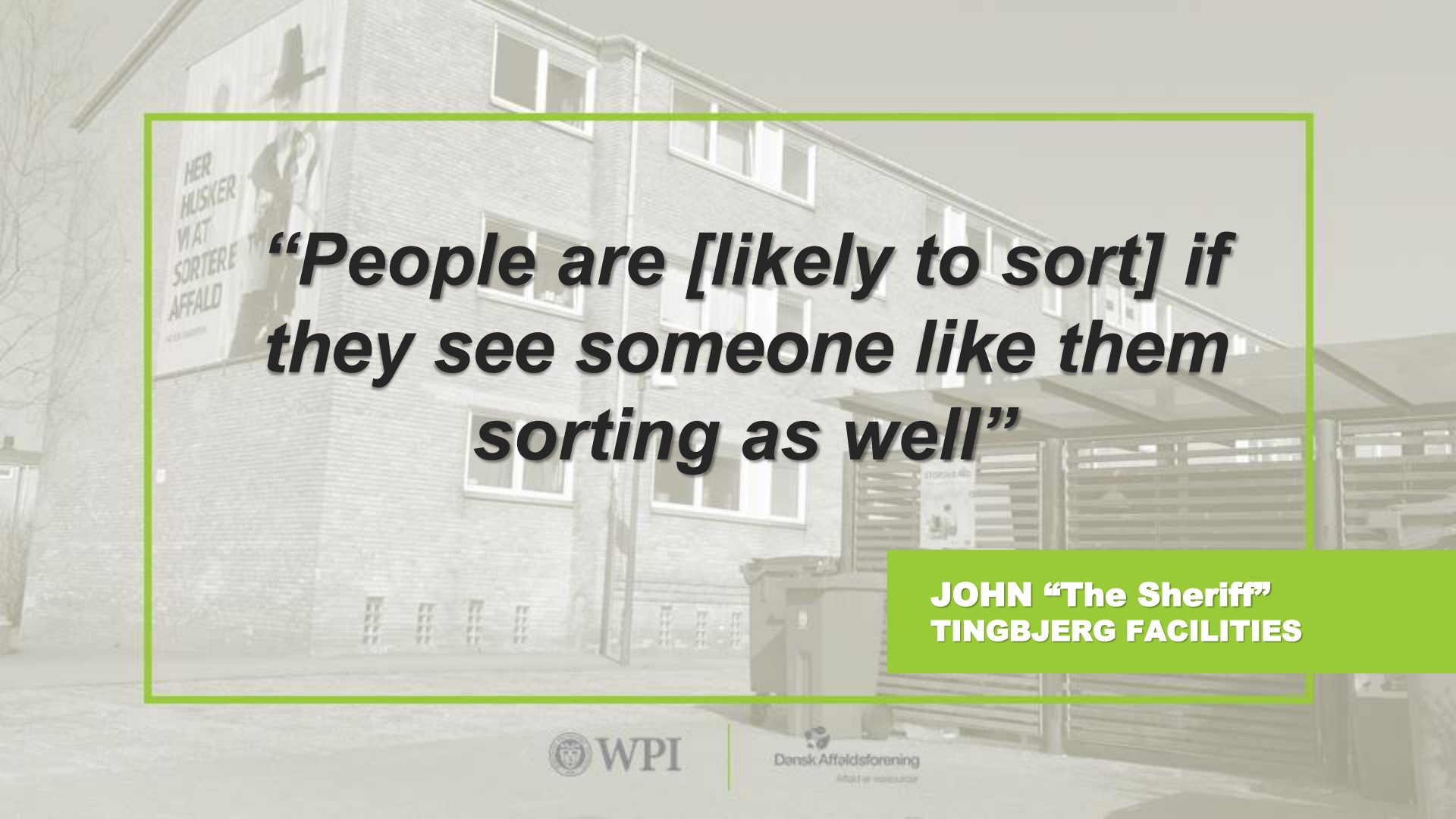






***“Instead of just giving out
flyers we engaged in dialog
with the residents”***

**ANNE BISGAARD
KATZEN-MARK**



“People are [likely to sort] if they see someone like them sorting as well”

**JOHN “The Sheriff”
TINGBJERG FACILITIES**



“Locals proposed new ideas like a Community Clean Up Day or a Flea Market concept”

**ANNE BISGAARD
KATZEN-MARK**

Tankegang partnered up with municipalities to challenge citizens to reduce their waste.

**128 FAMILIES PARTICIPATING IN
BRONDERSLEV AND HJORRING**

**50% REDUCTION OF UNSORTED
WASTE DURING THE PROJECT**

2ND STAGE IN TVERSTED

NULSKRALD



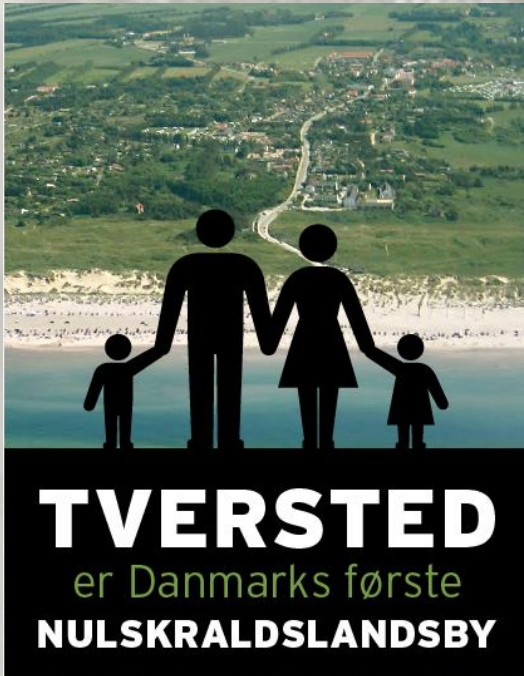
TANKEGANG

BRØNDERSLEV KOMMUNE



Hjørring Kommune





“Nulskrald became part of Tversted’s branding [...] visitors knew that Tversted was a zero waste town”

**STENER GLAMANN
TANKEGANG A/S**

The Green Embassy helps facilitate citizen-led initiatives by providing resources.

**“Good Advice
for Waste
Collection”**



Naboskab is a social enterprise that designs and facilitates community recycling “closets”.



NABOSKAB



Dansk Affaldstørelse

“The problem is that sometimes volunteerism and citizen-driven projects tend to die off over time”

**KRISTOFFER RAVNBØL
NABOSKAB**

COLLABORATION



COLLABORATION



PRIVATE SECTOR



**INTER-
DISCIPLINARY**



**RESEARCH AND
DEVELOPMENT**

**SUSTAINABILITY AT
BUSINESS CORE**

MARKET SHARE

IKEA has the resources to invest in research for design and customer behavior.



Life at Home Yearly Report



SPACE 10 Concept Development Lab



JONAS ENGBERG

IKEA Sustainability
Manager

Jonas has worked with the waste sector before and develops circular economy projects for IKEA.

**IKEA INSIGHTS AND
PRODUCTS**

**LOCAL UNIVERSITY
RESEARCH**

**AALBORG KOMMUNE
DECISION**



**AALBORG
KOMMUNE**

**WASTE
STRATEGY
PARTNERSHIP**

Vil du ha' hjælp
til at løse
affaldet?

***“We challenged the idea that
the public sector companies
and private sector companies
can’t work together.”***

**JONAS ENGBERG
IKEA**

In 2013, IKEA published waste sorting guidelines specific to each region in Denmark.

Kommune	Affaldstyper										
	Boligtube	Dagrenovation	Bio- / madaffald	Pap	Papir	Glas	Metall	Hård plastik	Batterier	Lyskilder	Elektronik
Faxe Kommune	✓	-	G	✓	G	G	G	✓(1)	G	G	
Greve Kommune	✓	-	G	✓							
Guldborgsund Kommune	✓	-	G	✓							
Holbæk Kommune	✓	✓	G	✓							

Affaldshjælp

Når affald sorteres kan materialerne bruges igen. Det er både miljømæssigt og økonomisk fornuftigt

Få et overblik over de forskellige affaldstyper, og de afhentninger, som sker i din kommune. Vælg din region på kortet til højre og find din kommune.

Find din region på kortet >



Not updated since 2013, IKEA plans to use the guides in the future to improve customer buying experience.

Vil du ha' hjælp
til at sortere
affaldet?

“We have a lot more traffic on our websites and in our stores than the municipalities’ buildings or their websites.”

**JONAS ENGBERG
IKEA**

Other private companies like PWS are directly involved in the design of waste systems used by the everyday citizen.



PWS will modify color, stickers, labels, and more at the request of the municipality.



Plastic tabs for the visually impaired.



NEW KITCHEN SORTING SYSTEM IN ZEALAND



TESTING IN 2000 HOMES IN
ZEALAND

INVOLVED MULTIPLE
PRIVATE AND PUBLIC
COMPANIES

FOLLOW UP WITH FACEBOOK
GROUPS, INTERVIEWS, AND
SURVEYS



Effektiv forsyning,
til for dig

TANKEGANG



Aage Vestergaard Larsen A/S
More end 40 års erfaring med genanvendelse af plast

SCHOELLER PLAST



REN
KÆRLIGHED TIL
KBH

COLLABORATION



PRIVATE SECTOR



**INTER-
DISCIPLINARY**

A row of grey mailboxes on a city street. The background shows a cobblestone sidewalk, parked cars, and multi-story buildings. A green border frames the central text area.

***“We have become a company
that treats citizens as customers
[...] customer service matters”***


**STINNE STOKKEBO
ARWOS**

**MANY
DISCIPLINES ARE
INVOLVED IN
CO-CREATION**

SOCIOLOGY

ENGINEERING

**MARKETING AND
COMMUNICATIONS**



“Co-creation influences the way we hire [...] we have a former teacher and a journalist on our team.”

**STINNE STOKKEBO
ARWOS**



NABOSKAB

PRIVATE SOCIAL ENTERPRISE

TEAM OF ANTHROPOLOGISTS

**PRESENTED A REPORT TO AID IN THE DESIGN OF
COPENHAGEN'S NEW WASTE STRATEGY**



REN
KÆRLIGHED TIL
KBH



“Our research uses qualitative approaches for quantitative goals”

**KRISTOFFER RAVNBØL
NABOSKAB**

TANKEGANG

KATZEN-
MARK 

PRIVATE MARKETING CONSULTANTS

SPECIALIZE IN WASTE AND UTILITIES

FACILITATE CUSTOMER OUTREACH



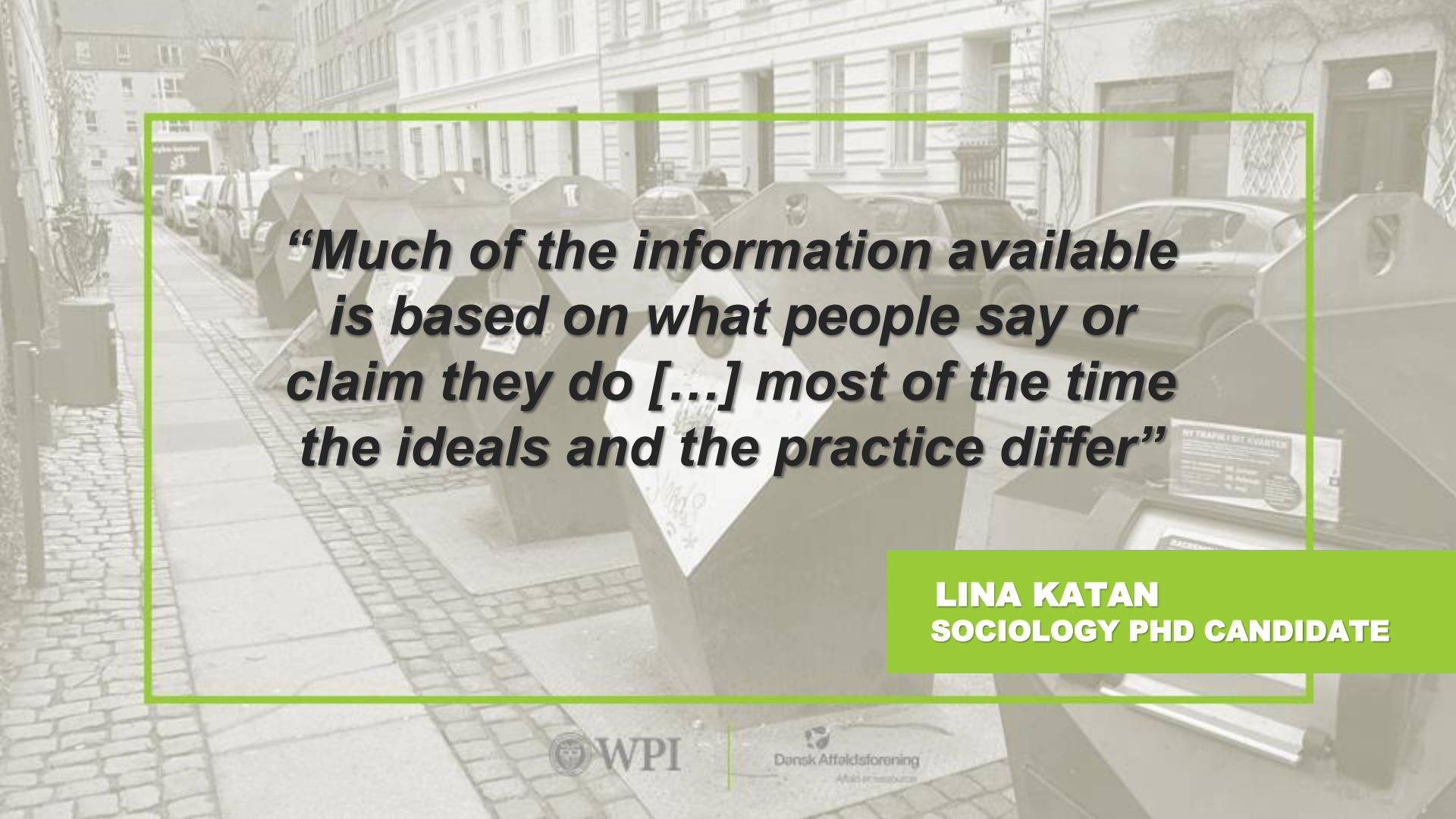
REN
KÆRLIGHED TIL
KBH

LINA KATAN

**SOCIOLOGIST WITH SPECIALIZATION IN
ETHNOGRAPHIC RESEARCH**

**PHD CANDIDATE PLANNING RESEARCH
WITH THE DWA**

**RESEARCH WILL FOCUS IN CITIZEN
BEHAVIOR AT HOME AND SORTING HABITS**



“Much of the information available is based on what people say or claim they do [...] most of the time the ideals and the practice differ”

LINA KATAN
SOCIOLOGY PHD CANDIDATE

MINDLAB

**INNOVATION UNIT
FUNCTIONING WITHIN THE
MINISTRIES OF INDUSTRY,
EMPLOYMENT, AND
EDUCATION**

**TEAM CONSISTING OF
SOCIAL RESEARCHERS**

**WORK AS INTERNAL
CONSULTANTS**



“Our unit tries to challenge those places where outside-in perspectives could be useful for public employees”

**ANNE BERG
MINDLAB**



OUTREACH

**CITIZEN
INVOLVEMENT**

**COLLABORATION
OUTSIDE WASTE**



PROJECT INTRODUCTION



BACKGROUND RESEARCH



FIELD RESEARCH



CONCLUSIONS AND RECOMMENDATIONS

THE CONCEPT OF CO-CREATION IS STILL IN THE **EARLY STAGES**

**DIFFERENT INTERPRETATIONS AND
DEFINITIONS**

DIFFERENT APPROACHES

MANY WAYS TO DO CO-CREATION

THE WASTE SECTOR IS BECOMING SERVICE ORIENTED

**HIGH FOCUS ON TREATING CITIZENS AS
CUSTOMERS**

INCREASINGLY DIVERSIFIED WORKFORCE

**AMBITIOUS GOALS FOR
RESIDENTIAL WASTE SORTING
REQUIRE CHANGES IN
BEHAVIOR FOR BOTH CITIZENS
AND PUBLIC SERVANTS.**

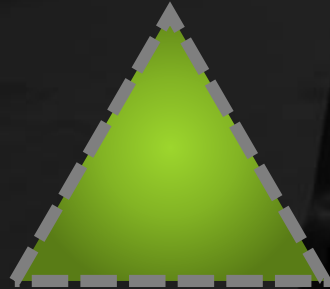
**WE
RECOMMEND:**



**THE IDEAL CO-CREATIVE PROJECT COMBINES
THE FOLLOWING 3 KEY ELEMENTS**

COLLABORATION

CUSTOMER
OUTREACH



CITIZEN
INVOLVEMENT

CUSTOMER OUTREACH

Use **social media and digital platforms as two-way communication, not just informing.**

Use **existing academic resources to engage with different audiences or host other events.**

Engage with citizens at **public spaces and events.**

CITIZEN INVOLVEMENT

Empower citizens to lead their own initiatives,
but be ready to **monitor progress closely.**

Present citizens with **options to choose from to**
receive better feedback.

Utilize citizen feedback to improve co-creation in
local communities or residential areas.

COLLABORATION

Invest resources in **behavior research** and hire colleagues with a **social science background**.

Work with **private companies** to expand research and design capacities.

Work with **other utilities companies**.



**SPECIAL
THANKS TO**



NIELS TOFTEGAARD

COMMUNICATIONS SPECIALIST

DANSK AFFALDSFORENING



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Affald er ressourcer



CONSTANCE CLARK

HUMANITIES AND ARTS DPT.

WPI PROJECT ADVISOR



HOLLY K. AULT

MECHANICAL ENGINEERING

WPI PROJECT ADVISOR

A black and white photograph of four young men standing in a factory or industrial setting. They are all wearing white hard hats and high-visibility safety vests over their shirts. They are smiling and looking towards the camera. The background shows industrial equipment, including conveyor belts and large stacks of material. The entire image is framed by a bright green border.

THANK YOU!