



ByMaker - Sustainable city game

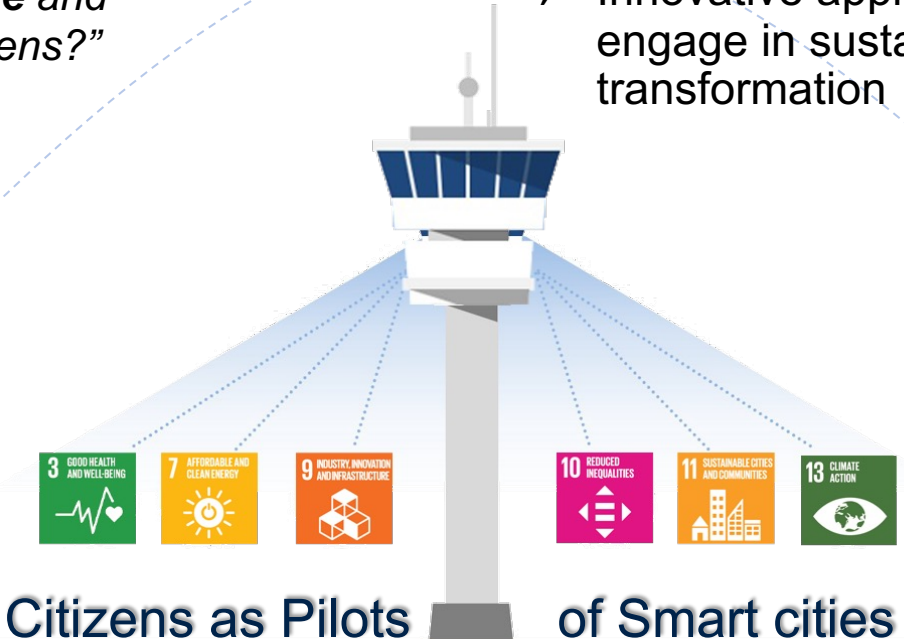
Coline Senior, Alenka Temeljotov Salaj, Agnar Johansen, Tahmineh Akbarinejad, Dave Collins

CaPs project



*“How can decision-making within key policy areas in Nordic municipalities integrate the **knowledge** and **engagement** of its citizens?”*

- Addressing the next generation of smart citizens
- Innovative approaches to engage in sustainable urban transformation



Citizens as Pilots of Smart cities



Hva var Behovet ?

UN Agenda 2030
Trondheim 2050

New Curriculum
in Norway

Sustainability Education
Planning and Building Act

Specific tools and
methods



Folkehelse og livsmestring, demokrati og medborgerskap, og bærekraftig utvikling «Elevene skal forstå hvordan vi gjennom kunnskap og samarbeid kan finne løsninger, og de skal lære om sammenhenger mellom handlinger og konsekvenser.» Overordnet del – Tverrfaglige temaer, Norsk Utdanning Direktoratet



Kapittel 5. Medvirkning i planleggingen

§ 5-1. Medvirkning

Enhver som fremmer planforslag, skal legge til rette for medvirkning. Kommunen skal påse at utførelse av andre offentlige organer eller private.

Kommunen har et særlig ansvar for å sikre aktiv medvirkning fra grupper som krever spesielle tjenester. Grupper og interesser som ikke er i stand til å delta direkte, skal sikres gode muligheter for medvirkning gjennom andre kanaler.

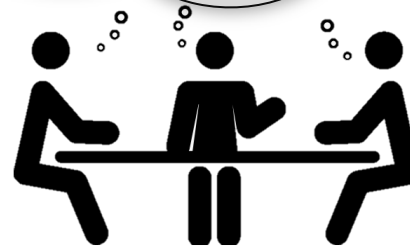
<https://lovdata.no/lov/2008-06-27-71/§5-1>



Hvordan kan vi få barn involvert og inkludert i tenkning rundt bærekraftig byutvikling?

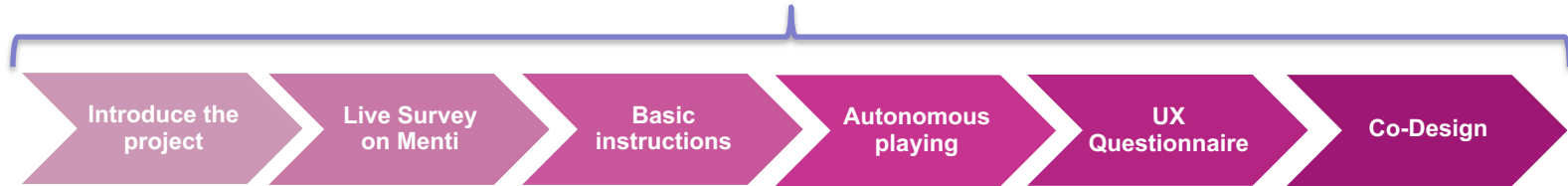
- Det hele startet som en idee skisse i April 2021- som en del av eksperter i teams
- Vi melder oss på «The Research Days/Forsknings dagen»
- Vi bør tren forskerne uten for sin komforsone
- ☞ Fra ide til spill på 4 uker - første prototype – utviklet av studenter ved NTNU sammen med forskerne i CaPS

collaborate in the development of their own environment with exciting digital solutions



Researchers Sprint – Co-creative process

Introduce Children to research
45 min. Activity for pupils (10-12 år)



Taking Research out of the University and into the schools

- 2 schools in 2021
- 3 schools in 2022

Researchers Sprint

Introduce the project

Live Survey on Menti

Basic instructions

Autonomous playing

UX Questionnaire

Co-Design

Nice people behind this project...

- From Finland, Denmark & Norway
- Citizens as Pilots of Smart Cities

Sustainable development & UN Sustainable Development Goals



Researchers Sprint

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Co-Design

Which words come to your mind when you hear about "sustainable development"?



What do you think we can do make the city more "sustainable" ?



Solar panels	More sustainable energy	Help the people
Recycling	Water power	Less plastic
Water power	Renewable energy	Recycling
Water power	Help eachother	Electric
Recycle	Solarpanels	Water power
PICK UP PLASTIC AND THINGS THAT CAUSE POLUSHON	Water power	Wind power

Trondheim International School, 6th Grade

Researchers Sprint

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- Basic commands
- 1st mission
- Information on screen

Researchers Sprint

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Researchers Sprint

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 **Be a Researcher !** 
(For each line, circle the smiley that reflects your mood)

What do you think about the game?

Exciting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Boring
Easy to play	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Difficult to play
Fun	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Serious
Looks colorful	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Looks dull
Looks tidy	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Looks messy
Fast enough	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Too slow

Was it nice to learn by playing ByMaker?

Yes, very nice! No, not nice at all.

Would you like to play ByMaker again in the future?

Yes, I would! No, never again.

Was it nice to play the game on the map of Trondheim?

Yes, very much! No, it did not matter.

Have you learned anything new today?

Yes, a lot! No, nothing.

Researchers Sprint

Introduce the project

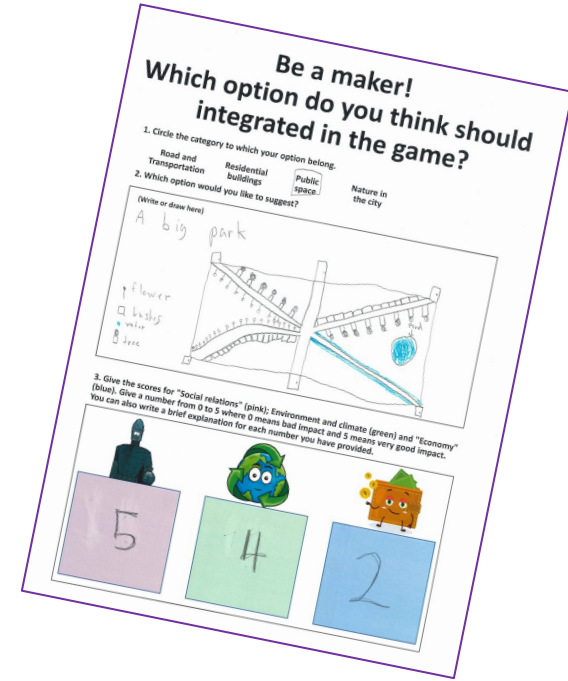
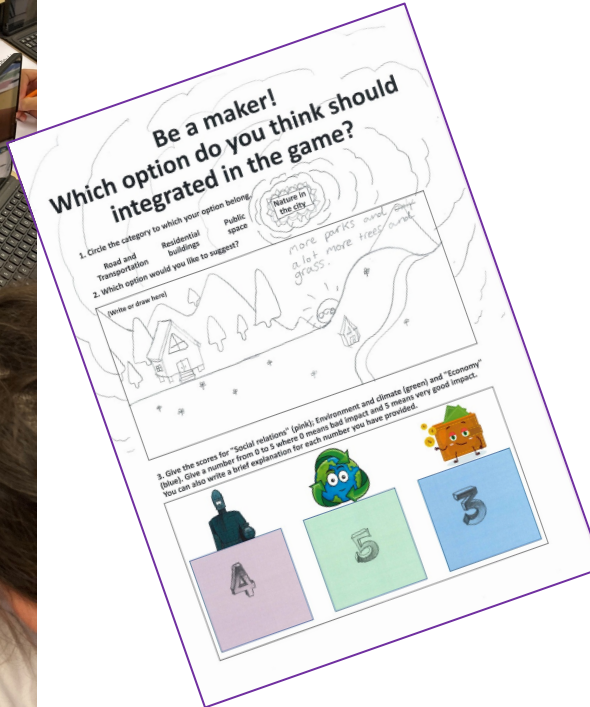
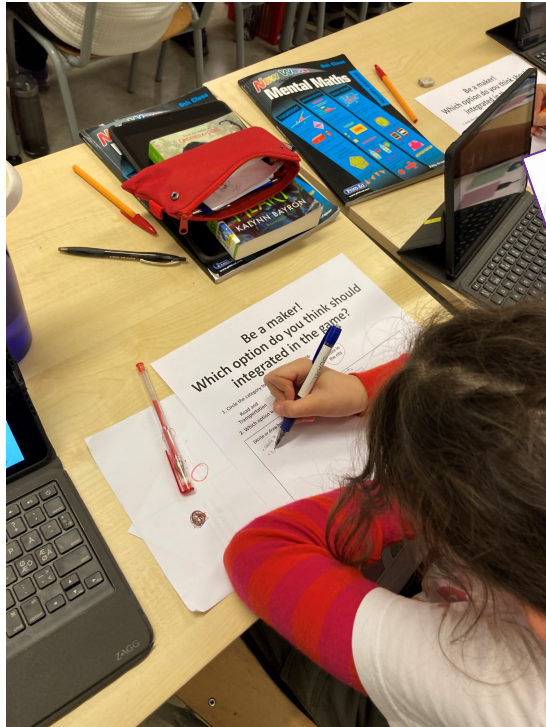
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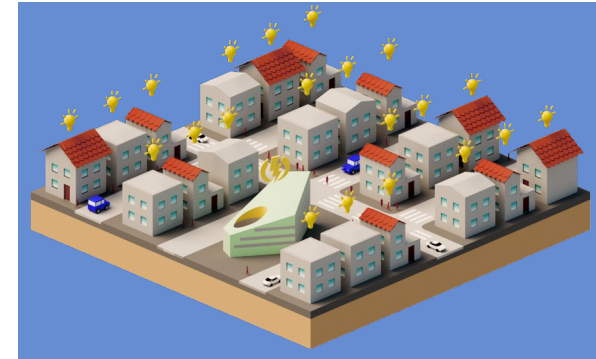


Vår løsning- ByMaker – reisen mot mer bærekraftig by

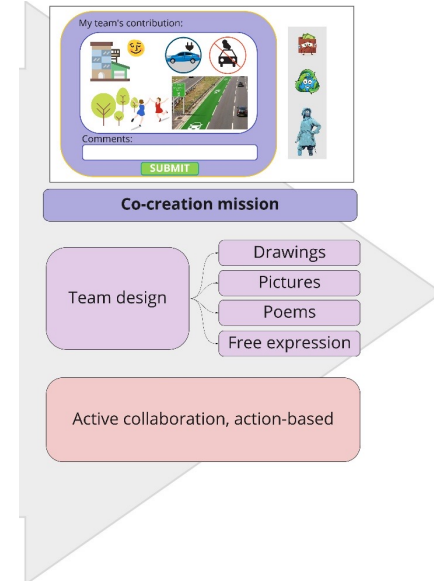
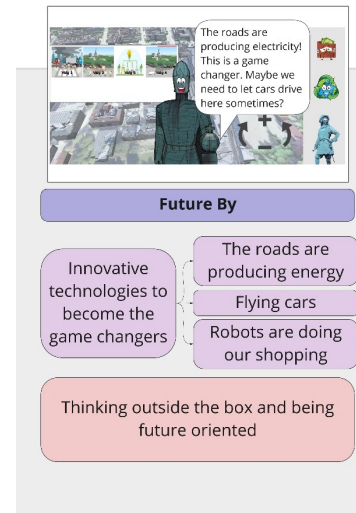
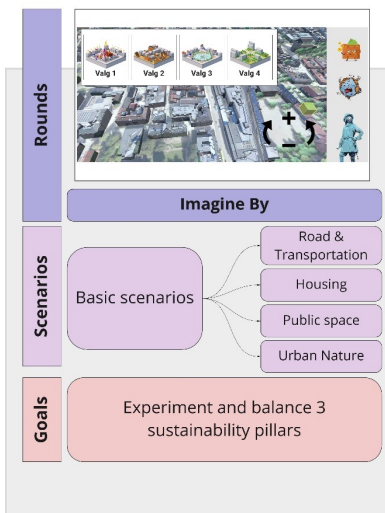
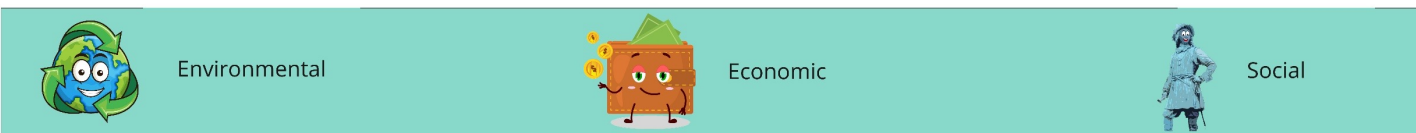
ByMaker is an online game for children and youth to raise awareness about the importance of balancing social, economic and environmental dimensions in the development of their cities.



- Scenario based
- Immersive virtual environment
- Popular landmarks and friendly historical figures
- Increase sense of belonging
- Critical thinking
- Anticipate future needs



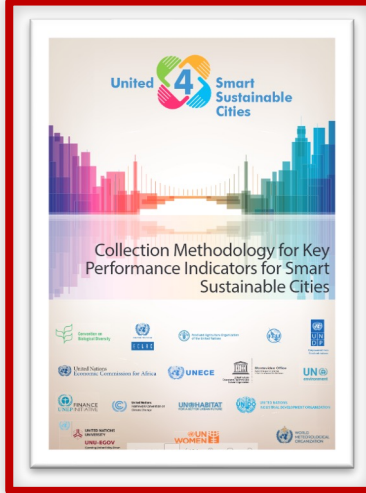
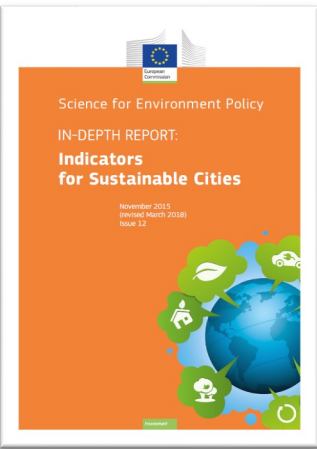
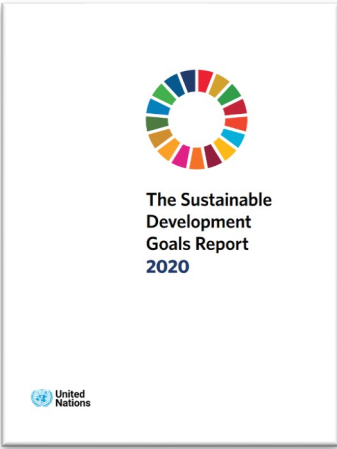
Vår løsning- ByMaker – reisen mote mer bærekraftig by



<https://bymaker.itch.io/city-planner-game>

Vår løsning- Science behind

How to select a sustainability assessment tool for the scoring system?



↑
UNECE KPIs used by most municipalities in Norway for Smart Cities projects

<https://miro.com/app/board/uXjVOHbYGhA=>

PhD research- ByMaker



Forskersprinten 2021 & 2022

ByMaker
The City Planning Game that will teach you about sustainability and urban planning.

START

The interface features a green background. At the top center is a large green button with the word "START" in white. Below the button are three cartoon characters: a blue and green Earth with a green arrow (Environment), a grey robot (Economy), and a brown wallet with a pink face and gold coins (Society).

Multidisciplinary international team

The ByMaker team is international and multidisciplinary with brilliant minds from the fields of psychology, architecture, design, engineering, IT, project management and health.



Coline Senior
Founder



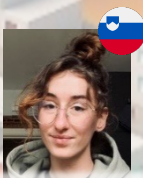
Alenka Temeljotov
Salaj
Co-founder & Innovation
advisor



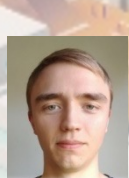
Mara Diaconu
Co-founder & Business
advisor



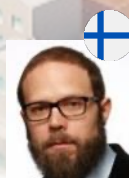
Agnar Johansen
Co-founder &
Sustainability advisor



Ana Cepuran
IT Developer & Game
advisor



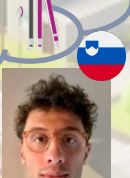
Andreas Oksvold
IT Developer



Project Manager for
Tampere, FI



Geetika Bhutani



Nikolaj Salaj

Architects and Designers

Original content creators

Thank you !



• Architect

• PhD candidate
in Civil and
Environmental
Engineering

• Gamer and
user co-
creation

• Professor in
Urban Facilities
Management

• Vice Dean
Innovation, IV
Faculty

• PhD in
Psychology

• EU Project
Developer,
MH faculty

• Innovation in
products

• PhD
candidate in
Innovation at
IV Faculty

• Professor in
Project
Management

• Leader of
MoST

• PhD in Civil
and
Environmental
Engineering

• Software
Developer

• Graphic
Designer

• MSc in
Multimedia
Engineering

• Software
Developer

• Augmented
Reality
Expert

• Gamer

• Professor in Project
Management

• PhD in Industrial
Engineering and
Management

• Leader of CaPs-
«Citizens as Pilots of
Smart Cities»
Research project
(Nordforsk)



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www.by-maker.com




<https://itch.io/profile/bymaker>



Bli med på reisen da vell!

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 <https://itch.io/profile/bymaker>

The ByMaker Journey



Citizens as Pilots of Smart Cities

In 2020, the CaPs project is granted a 3 year funding by Nordforsk. NTNU collaborates with Tampere University (Leader), Lappeenranta University and Copenhagen Business School.



Best Paper Award by NTNU Researchers

- NTNU
- Repetitions
- Course Quality
- Make Jannes
- Almas
- 4 Norwegian cities
- used smart
- urban data for
- "Smart Cities" by
- "Smart Cities" by
- Tampere University
- Lappeenranta University
- Copenhagen Business School
- NTNU
- participants 3000

Demo

<http://bymaker.itch.io/bymaker3> (ENG)

<http://bymaker.itch.io/bymaker2> (NO)