

# Urban Tech

October 2021



# 2150

## Urban Sustainability Technology Fund

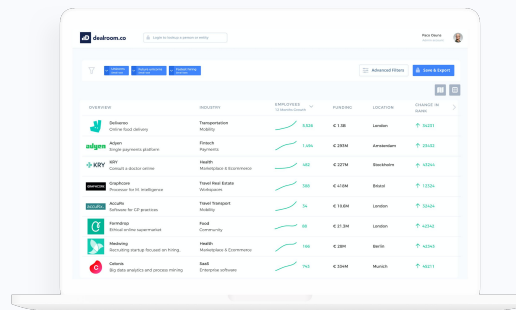
2150 is a venture capital firm investing in technology companies that seek to sustainably reimagine and reshape the urban environment and enable a sustainable and scalable future of mass urbanisation. 2150's investment thesis focuses on major unsolved problems across what it calls the 'Urban Stack', which comprises every element of the built environment, from the way our cities are designed, constructed and powered, to the way people live, work, move, and are cared for. See more at 2150.vc



## Global startup & venture capital intelligence platform.

Dealroom.co is the foremost data provider on startup, early-stage and growth company ecosystems in Europe and around the globe.

Founded in Amsterdam in 2013, we now work with many of the world's most prominent investors, entrepreneurs and government organizations to provide transparency, analysis and insights on venture capital activity.



# Key trends, and why Urban Tech matters.



## Cities are booming, and so is sustainable urban tech

Urban tech startups have raised a record €23B in 2021 year to date, 4.4x the amount raised in 2016. Heavy industry giants such as Cemex and Vale became active urban tech investors.

### Why it matters:

The battle for climate change will be won or lost in how we manage emissions from cities. More investment in urban tech is required to hit net-zero targets.



## Materials & infrastructure is the fastest-growing segment for urban tech unicorns

There are 75 sustainable urban tech unicorns, mainly in clean energy or mobility. Six sustainable infrastructure & material companies became unicorns in 2021, at a faster growth rate compared to energy and mobility.

### Why it matters:

15% of CO<sub>2</sub> emissions come from materials and infrastructure<sup>1</sup>. Unicorns are needed now to drive the scale required across all urban tech sectors.



## High emission sectors are highly underfunded startup segments

Heating, cooling, concrete, steel and other materials startups are all underfunded. Record investment into concrete and cement in 2021 year to date shows how this can change fast.

### Why it matters:

Concrete alone is responsible for 8% of global emissions<sup>2</sup>, and buildings take up a large portion at 36%<sup>3</sup>. Investments here can drive greater impact.

1) <https://nyti.ms/30p93U1>

2) <https://psci.princeton.edu/tips/2020/11/3/cement-and-concrete-the-environmental-impact>

3) [https://ec.europa.eu/info/news/focus-energy-efficiency-buildings-2020-feb-17\\_en](https://ec.europa.eu/info/news/focus-energy-efficiency-buildings-2020-feb-17_en)

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**1**

# Introduction

# The built environment is a largely undigitized \$5T market set for rapid growth.

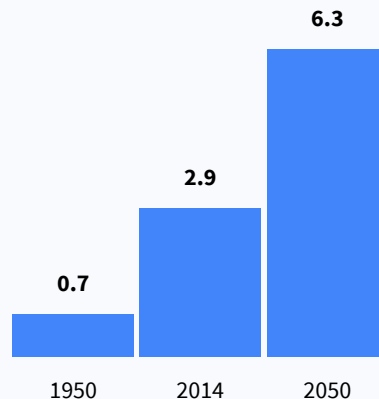
Construction and real estate is currently  
a massive industry

**\$5T**

Total annual spend on buildings  
construction and renovation

Rapid urbanization will create exponential  
growth in demand

Global urban population in billions



# Cities are the most vulnerable to climate change, but they are also part of the solution for climate mitigation and adaptation.



**91%**

of the world's population live in place where air quality exceeds WHO guideline limits<sup>3</sup>.



**60%**

of global greenhouse gas emissions derive from cities<sup>2</sup>.



**25%**

of the world's population is exposed to deadly city heat<sup>1</sup>.

Source: 1) <https://www.pnas.org/content/118/41/e2024792118> ;

2) Cities and Pollution - United Nations, <https://www.un.org/en/climatechange/climate-solutions/cities-pollution>

3) [https://www.who.int/health-topics/air-pollution#tab=tab\\_1](https://www.who.int/health-topics/air-pollution#tab=tab_1)

# What is Urban Tech?

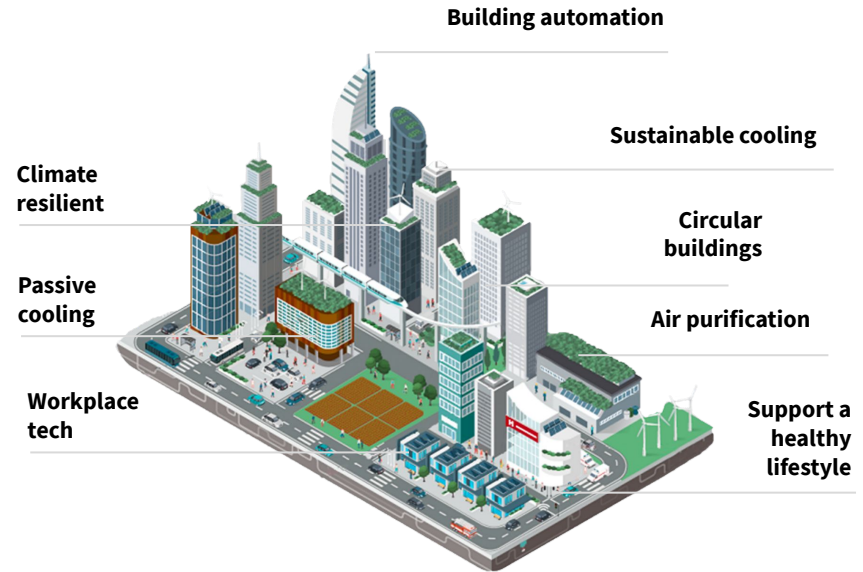
Urban tech is technology that **improves broad urban environments to make them more sustainable, resilient and efficient**. Although governments and regulation may be involved, urban tech primarily targets the private sector, selling to businesses and consumers directly.

## Why Urban Tech?

Urbanization is accelerating, and fast. By 2050 it is expected that 70% of the global population will live in cities<sup>1</sup>, and we are not prepared for the additional strain on our infrastructure, natural resources, and housing.

Cities consume 2/3 of the world's energy and produce more than 60% of GHG emissions<sup>2</sup>. Urban Tech solutions can play a major role in reducing emissions on an accelerated timeline, which is key to managing current growth.

Building effective cities requires inclusive, healthy, resilient and sustainable solutions. Urban tech startups are building solutions that are reducing emissions and preserving resources TODAY.



Source:

1) <https://www.fastcompany.com/1669244/by-2050-70-of-the-worlds-population-will-be-urban-is-that-a-good-thing>

2) Cities and Pollution - United Nations, <https://www.un.org/en/climatechange/climate-solutions/cities-pollution>

## Urban Stack: Investing across the Urban Stack represents a huge investment opportunity and the biggest lever for creating a sustainable future. ([More on why here](#))

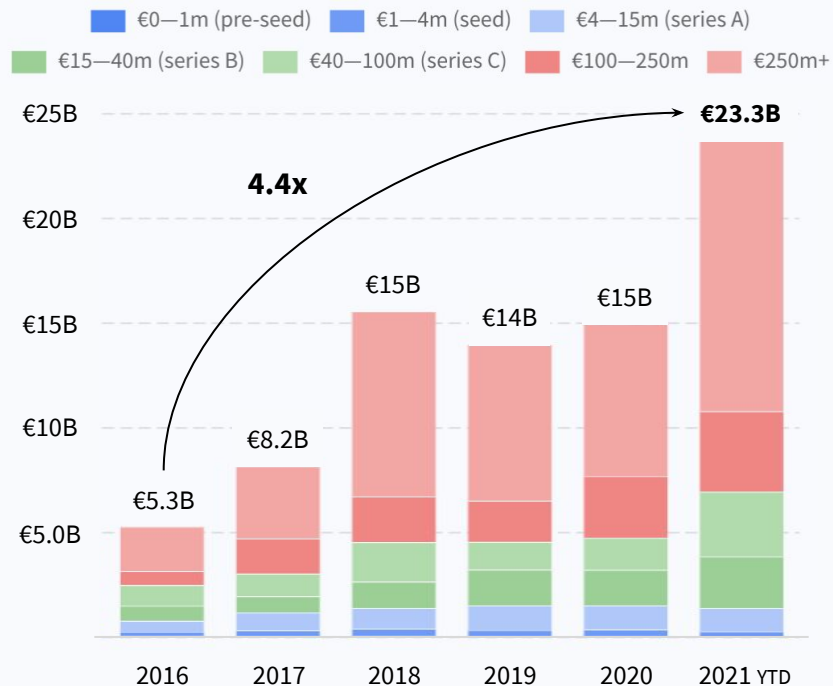
<b>Experience</b>	Workplace tech / Future of Work	Air quality/ Air pollution	Healthy buildings	Safety and security
<b>Operate</b>	Building automation, heating & cooling	Urban mobility and logistics	Facility management	Sustainability tracking and ESG management
<b>Build</b>	Concrete, steel and new sustainable materials	New construction methods and modular construction	Carbon Capture & Storage	Construction software and automation
<b>Enable</b>	Waste management	Intelligent and digital Infrastructure	Water infrastructure	Clean energy & grid technologies

## 2

# Investment Trends & Gigacorns

# Urban Tech startups have raised a record €23B so far in 2021.

## VC investment into Urban Tech startups » [view online](#)





# Most active sustainable urban tech venture capitalists.

## Pre-seed and seed



Urbio, Therma, BlocPower



Omnidian, FreeWire Technologies, Abatable



Zoomo, Imbalance grid, Urbio



Audette, Axiom Cloud, AmpUp



ClimateView, Whywaste, Northvolt



Climate X, Monta, HIVED

## Early stage



Aeroseal, LuxWall, Ecocem



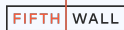
LuxWall, Planet Labs, Heirloom Carbon



Plan A, See You Sun, Deepki



Solugen, Cloud to Street, Cervest



ICON, Sealed, SmartRent



CarbonCure, Ampd Energy, Nodes & Links

## Late stage



ENERGY IMPACT PARTNERS

Measurabl, Volta Charging, Ecobee



Fortera, Juno Residential, View



Redwood Materials, Twelve, Joby Aviation



Solugen, Svante, SES



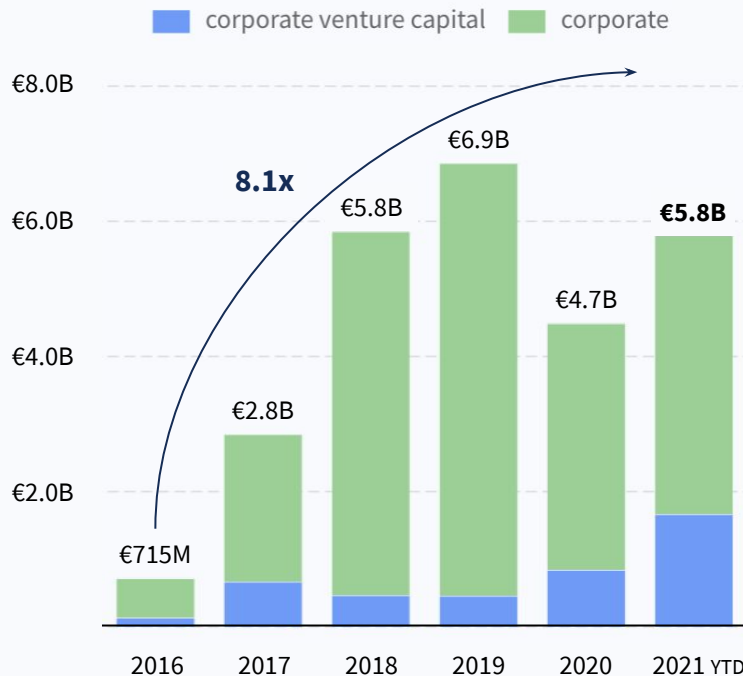
Patch Rivian Automotive, Form Energy



Boston Metal, Joby Aviation, Rivian

# Corporate investment in Urban Tech increased substantially, growing 8x since 2016 to €5.8B in 2021 year to date.

Corporate investment into Urban Tech startups » [view online](#)



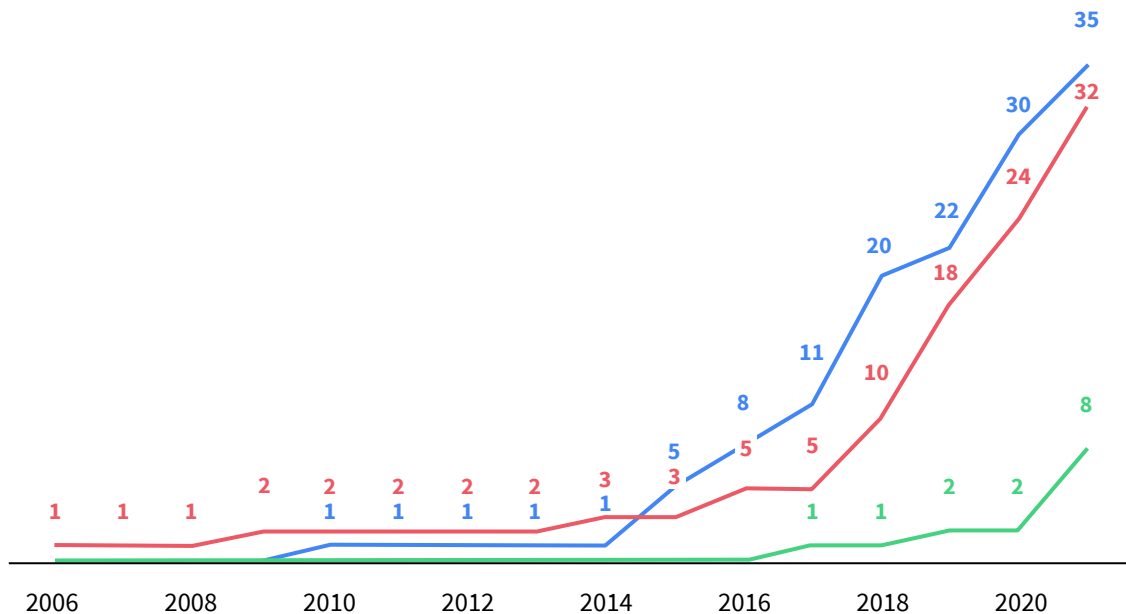
# Heavy industry giants are now active Urban Tech investors.

Corporate	Target	Funding date	Transaction
 <p>SK group Conglomerate</p>	 <p>Solid Energy Systems Solid-state battery</p>	Apr 2021	\$139M Series D
 <p>Marcegaglia Steel manufacturer</p>	 <p>H2 Green Steel Sustainable steel</p>	May 2021	\$105M Series A
 <p>TotalEnergies Oil &amp; Gas</p>	 <p>Solidia Technologies Sustainable cement</p>	Apr 2021	\$78M Late VC
 <p>Cemex Cement manufacturer</p>	 <p>Carbon Clean Solutions Carbon capture</p>	July 2021	\$30M Series B
 <p>Vale Mining company</p>	 <p>Boston Metal Sustainable steel</p>	Feb 2021	\$6M Late VC
 <p>Caterpillar Construction equipment</p>	 <p>Infinitum Electric Electric motors</p>	Aug 2021	Undisclosed Late VC
 <p>Mitsubishi Conglomerate</p>	 <p>CarbonCure Sustainable cement</p>	Jan 2021	Undisclosed Late VC

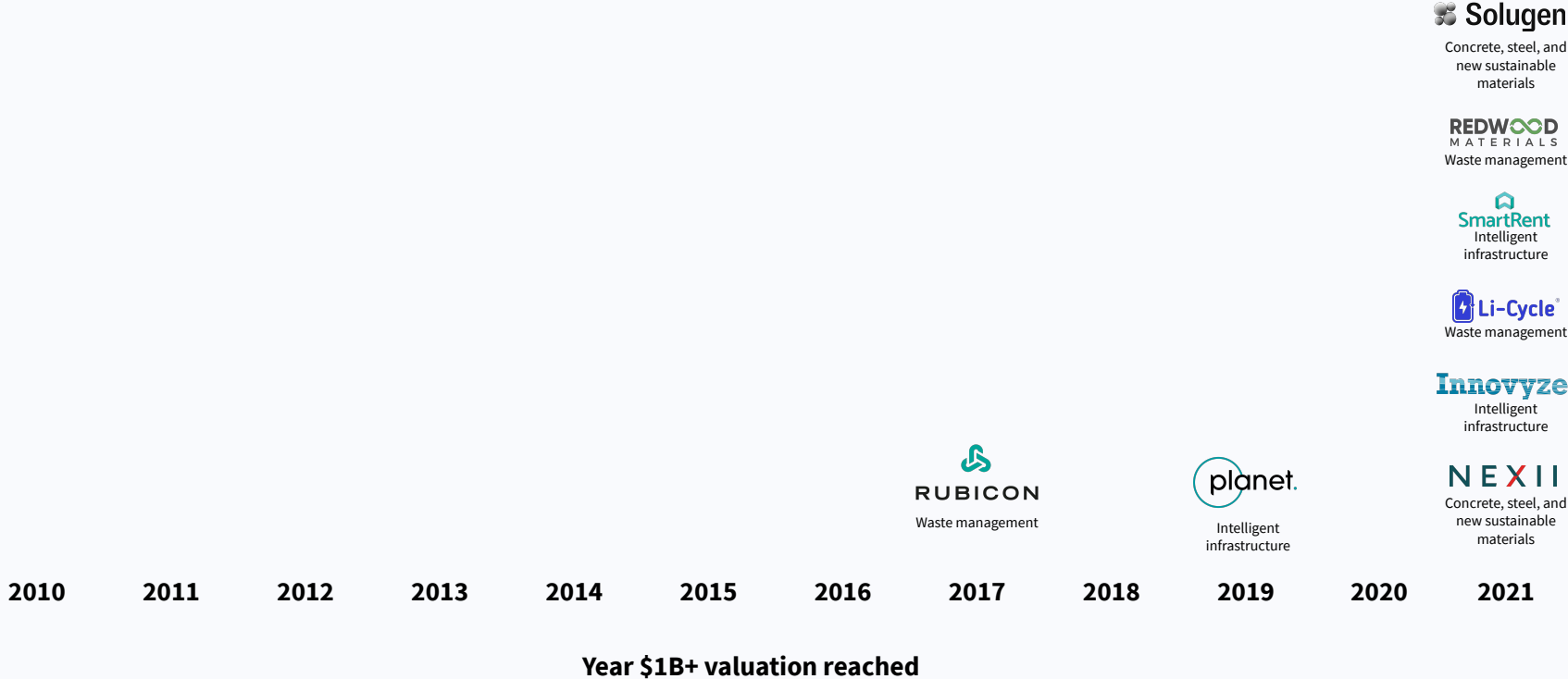
# 67 of the 75 Urban Tech unicorns are operating in either clean energy or urban mobility.

Number of Urban Tech unicorn per segment (cumulative) - [view online](#)

Urban mobility & logistics Clean energy & grid technology Other categories



# But 2021 saw 6 new Urban Tech unicorns emerge within infrastructure and sustainable materials.



# Hunting for Gigacorns

**Gigacorn (noun) def:** a company that has achieved lowering or sequestering CO2 emissions by 1Gt/year while being commercially viable. ([more on Gigacorns here](#))

**36<sup>GT</sup>**  
PER YEAR

Globally we emit **36GT annually**. For perspective 1GT is equal to the entire emissions from the EU transportation sector annually, or 30% of all EU emissions

**75**

We have gone from 338 unicorns in 2015 to 1,967 now, but only 75 are in the Urban Tech sector. We need to catalyze Gigacorns, just 36 can get our global emissions to net zero.

**9.3x**

We have not yet seen a Gigacorn, but over the last six years **sustainable Urban tech unicorn growth has been 9.3x**, compared to the overall number of unicorns at 5.8x.

# 3

## Enable

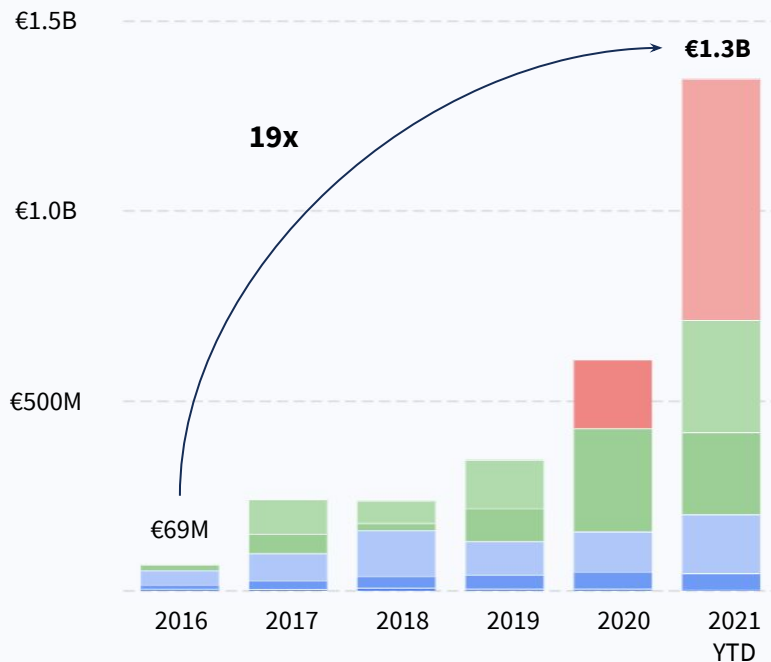
Enabling infrastructure technologies and platforms that allow urban areas to scale sustainably and resiliently.



# Investment into waste management has reached €1.3B in 2021. 19x compared to 2016, a much higher growth compared to overall Urban Tech.

VC investment into waste management startups » [view online](#)

Biggest rounds of 2021 YTD » [view online](#)



NAME	INVESTORS	MARKET	LOCATION
<b>Redwood Materials</b> Providing advanced technology a...	Valor Equity Partners Fidelity Capricorn Investment Group Ballie Gifford Franklin Templeton Investments	energy energy storage waste solution	Carson City, United States
<b>Do Good Foods</b> Collects foods such as fruits, veget...	Nuveen, a TIAA company	food energy waste solution in-store retail & restaurant tech app/tech	United States
<b>Bolder Industries</b> We solve environmental issues for ...	CIM Group Aravaipa Venture Tauber Oil Company	energy waste solution	Boulder County, United States
<b>Svante</b> Makes commercial-scale carbon c...	Temasek BDC Chrysalis Venture Capital The Roda Group Chevron Technology Ventures	energy clean energy waste solution	Burnaby, Canada
<b>EcoATM</b> An e-waste recycling company tha...	Cowen Group	energy waste solution	San Diego, United States
<b>Battery Resources</b> Provides recycling for lithium ion ...	Hitachi TRUMP Venture ImMotion Ventures TDK Ventures At One Ventures	energy waste solution energy storage	Worcester, United States
<b>AMP Robotics</b> Creates robotic systems that sort r...	Sequoia Capital GV Valor Equity Partners Closed Loop Partners Congruent Ventures	energy robotics waste solution	Louisville, United States
<b>Redwood Materials</b> Providing advanced technology a...	Ford Motor Company	energy energy storage waste solution	Carson City, United States
<b>OLIO</b>	Accel Jason Stockwood Rubio Impact Ventures	food energy	London, United Kingdom

# A strong pipeline of startups are tackling the most important challenges in waste management.

## Plastic recycling



Biorecycling of plastic waste

**Total funding:** €7.4M  
**Valuation:** €486M  
**Launch year:** 2011

Examples:



## E-waste and batteries



End-of-life of EV batteries

**Total funding:** €720M  
**Valuation:** €3.4B  
**Launch year:** 2017

Examples:



## Recycling AI/Robotics



Waste management software for businesses and governments.

**Total funding:** €248M  
**Valuation:** €1.0B  
**Launch year:** 2008

Examples:



## Waste water



Clean chemicals for water treatment

**Total funding:** €370M  
**Valuation:** €1.6B  
**Launch year:** 2016

Examples:



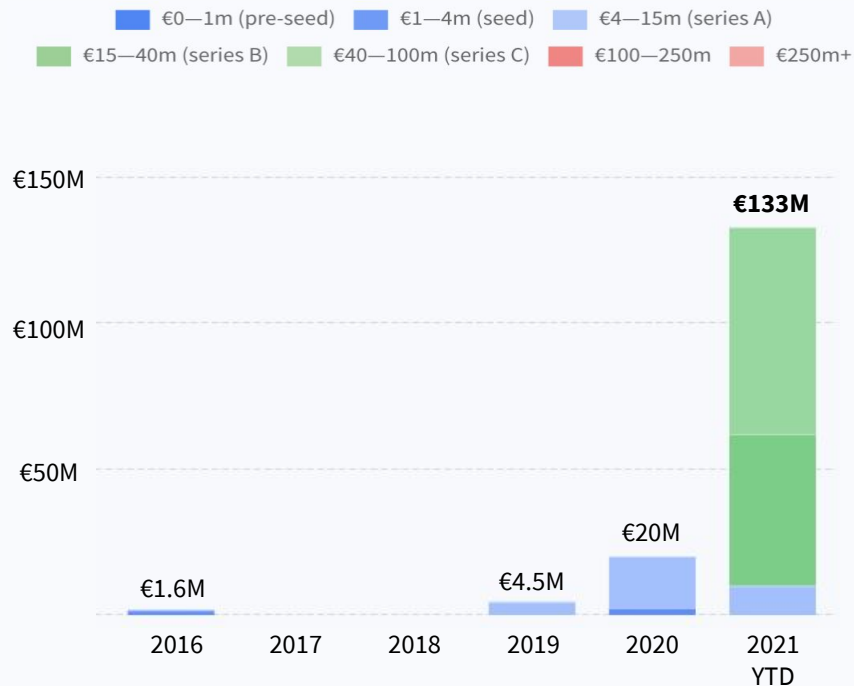
# 4

## Build

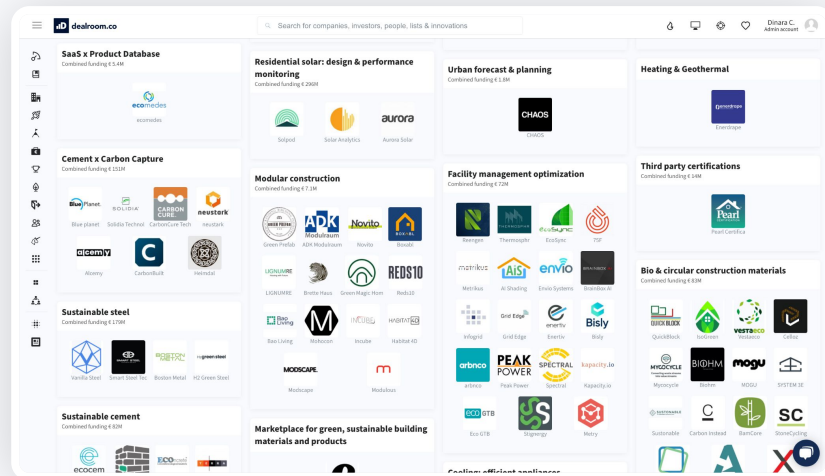
How we **build** including planning, materials, construction and processes.

# In past years, sustainable cement and concrete startups raised negligible amount of capital. This changed in 2021.

VC investment into sustainable cement startups » [view online](#)



Explore sustainable cement startups » [view online](#)



“Our ambitious mission is to remove 500 million tonnes of CO<sub>2</sub> emissions from the concrete industry annually by 2030, equivalent to taking 100 million cars off the road each year.”

[Read the full interview](#)



**Rob Niven**

Founder & CEO



Introduces captured CO<sub>2</sub> into fresh concrete

# 5

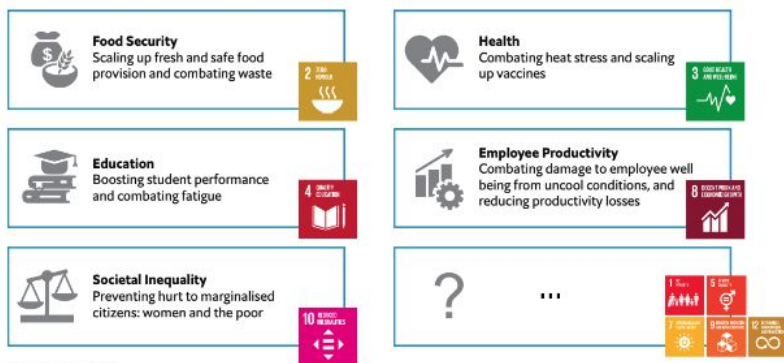
## Operate

Sensors and platforms to monitor, control and optimize buildings, cities, and streets.

# Sustainable heating & cooling in real estate.

## Making sustainability cool

How cooling will help achieve priority SDG goals



Source: EIU; UNDP

The cooling of buildings, industrial processes, and supply chain accounts for **7% of global GHG emissions**, which is higher than aviation that sits at 2%.<sup>1</sup> More importantly, cooling consumption is expected to increase with over 7 billion air conditioning units in operation by 2070<sup>2</sup>. This is linked to the changing climate, the increased frequency of extreme weather events such as heat waves, and the heat island phenomenon in urban environments.

Air conditioning is an example of the climate feedback loop: the warmer the climate the higher the use of cooling systems, and the higher the amount of GHG emitted.

There are a number of challenges with increased cooling needs that will inhibit achieving net zero targets:

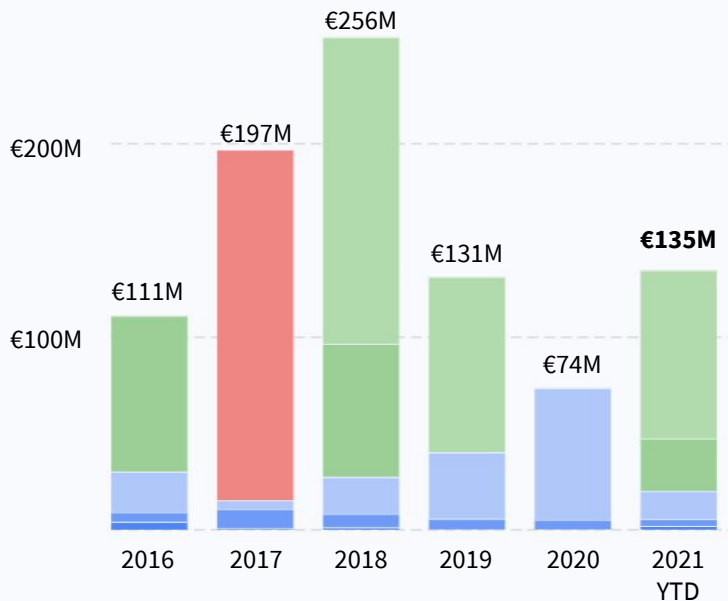
- 1) Increased energy burdens, particularly at peak hours
- 2) Many cooling solutions will be in emerging markets where cost, not efficiency, will dominate tech solutions deployed, and
- 3) Refrigerants in AC technology are much more harmful than CO2 emissions.



# Sustainable cooling and heating startups attract just a fraction of the Urban Tech investment, with significant room for growth.

VC investment into sustainable cooling startups<sup>1</sup> » [view online](#)

■ €0—1m (pre-seed) 
 ■ €1—4m (seed) 
 ■ €4—15m (series A) 
 ■ €15—40m (series B) 
 ■ €40—100m (series C) 
 ■ €100—250m 
 ■ €250m+



Explore the startups » [view online](#)

**Efficient air cooling and heating**  
Combined funding: € 258M

**SaaS and IoT for cooling**  
Combined funding: € 283M

**Passive cooling: smart buildings**  
Combined funding: € 1.7B

**SaaS and IoT for heating**  
Combined funding: € 228M

1. In 2018, the smart window startups View received a \$1.1B round from Softbank. This outlier has been excluded from the chart. Source: Dealroom.co.

# Passive Cooling, Software and IoT Solutions for heating/cooling attracted the most funding.

## Efficient appliances and enabling technology

Efficient technology for residential and commercial heating and cooling: thermoelectric air coolers, refrigerant technology, boilers and heat pumps.

**Combined funding: €239M**

Examples:

PHONONIC

AERDSEAL

Blue Frontier

Degree n

## Smart conditioning and thermostat

Software and IoT solutions to make air conditioners and thermostats smarter.

**Combined funding: €512M**

Examples:

tado°

ecobee

switchee

Sensibo

## Thermal energy storage, heat pumps, geothermal and solar

Tapping into energy sources such as stored heat, solar and geothermal to reduce energy consumption from heating and cooling

**Combined funding: €239M**

Examples:

NOSTROMO

mixergy

DANDELION

## Passive cooling

Passive solutions to reduce the heat absorbed or lost by the building, including smart windows, smart coatings and built environment design.

**Combined funding: €1.7B**

Examples:

view

KINESTRAL

Gouzy

Albotherm

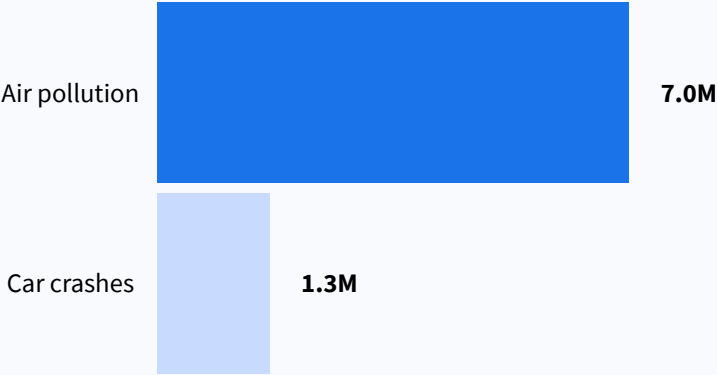
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## Experience

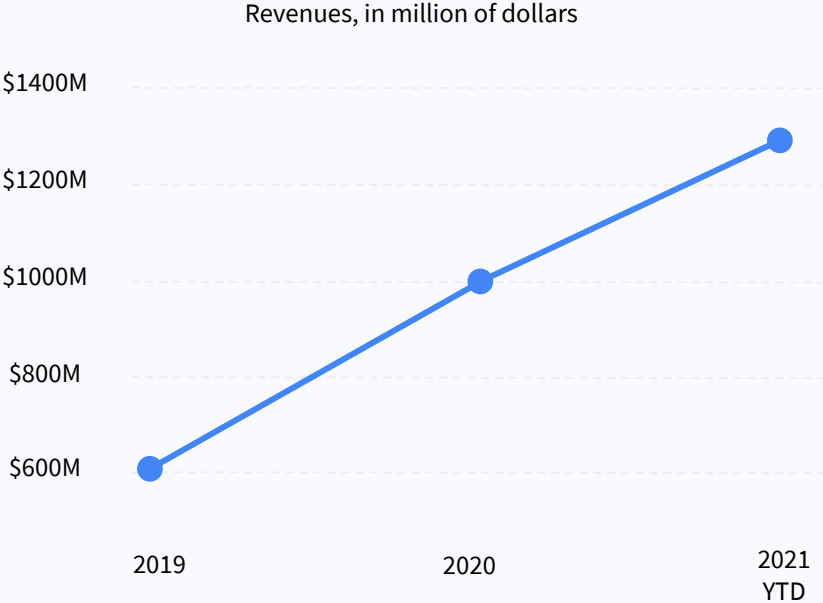
Allowing citizens to work, live,  
stay healthy and secure.

# Poor air quality is a major environmental risk to public health. The air purification industry is surging, as a result of people seeking cleaner air.

Estimated global deaths every year<sup>1</sup>



Booming business: the purifier market is growing

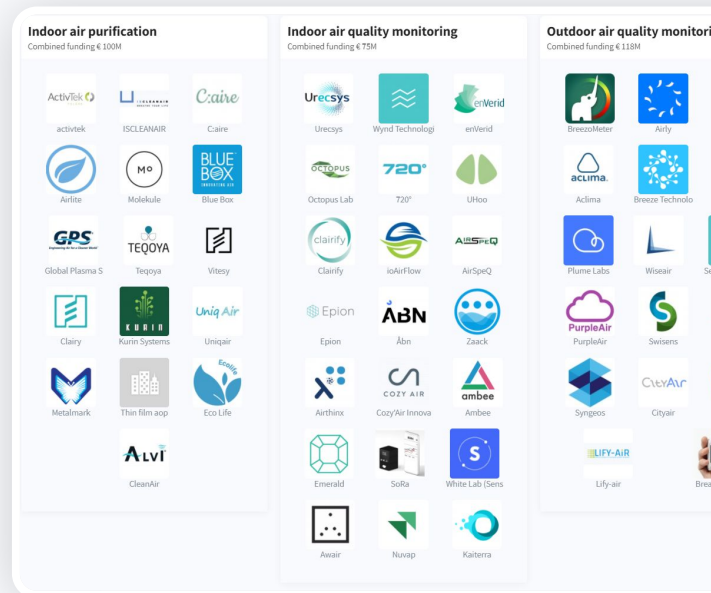


# Yet, air quality startups are significantly underfunded.

Investment into air quality monitoring and treatment startups » [view online](#)



Explore the startups » [view online](#)



# Overall, air monitoring startups are the ones attracting the most funding.

## Indoor

### Air monitoring

Sensors and data analysis solutions to monitor indoor air quality, from pollutants and virus to odors.

**Combined funding: €75M**

Examples:



WYND



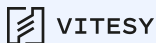
### Air purification

Devices for purification of indoor air in spaces such as homes, offices, cars and industrial buildings.

**Combined funding: €100M**

Examples:

MOLEKULE



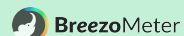
## Outdoor

### Air monitoring

Network of sensors and data analysis solutions to create intelligent air maps for people, companies and cities.

**Combined funding: €118M**

Examples:



### Air purification

Solutions for purification of outdoor air to reduce pollution in cities.

**Combined funding: €2M**

Examples:



GRAVIKY LABS



# Venture capital methodology and definitions.

## Startups, scaleups, grownups and tech

Companies designed to grow fast. Generally, such companies are VC-investable businesses. Sometimes they can become very big (e.g. \$1B+ valuation).

When startups are successful, they develop into scaleups (>50 people), grownups (>500 people) and result in big companies, like Arrival or Northvolt.

Only companies founded since 1990 are included in this report.

## Venture capital investment

Investment numbers refer to rounds such as Seed, Series A, B, C, .... late stage, and growth equity rounds.

Venture capital investment figures exclude debt or other non-equity funding, lending capital, grants and ICOs.

Buyouts, M&A, secondary rounds, and IPOs are treated as exits: excluded from funding data.

Investment rounds are sourced from public disclosures including press releases, news, filings and verified user-submitted information.

## Accelerators and workplaces

Fixed-term, cohort-based programs that include seed investment, connections, sales, mentorship, educational components and culminate in a public pitch event or demo day to accelerate growth.

We consider an accelerator as an 'investor' since it takes equity from its startups whereas a 'workplace' does not take equity from its tenants.

In this report, co-working spaces, shared office space that also offer community support, are considered as part of workplaces.

## Valuation

The combined valuation of the tech ecosystem is based on their market cap or latest transaction value.

Transaction value is realized from exit or implied unrealised valuation from the latest VC round, which is either announced or estimated by Dealroom based on benchmarks.





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