

COMODULE 

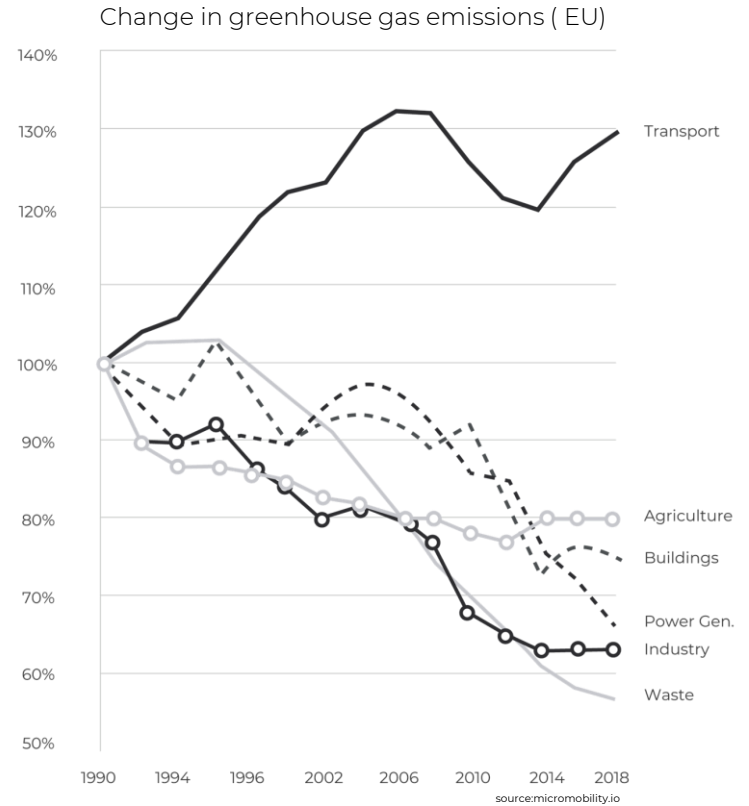


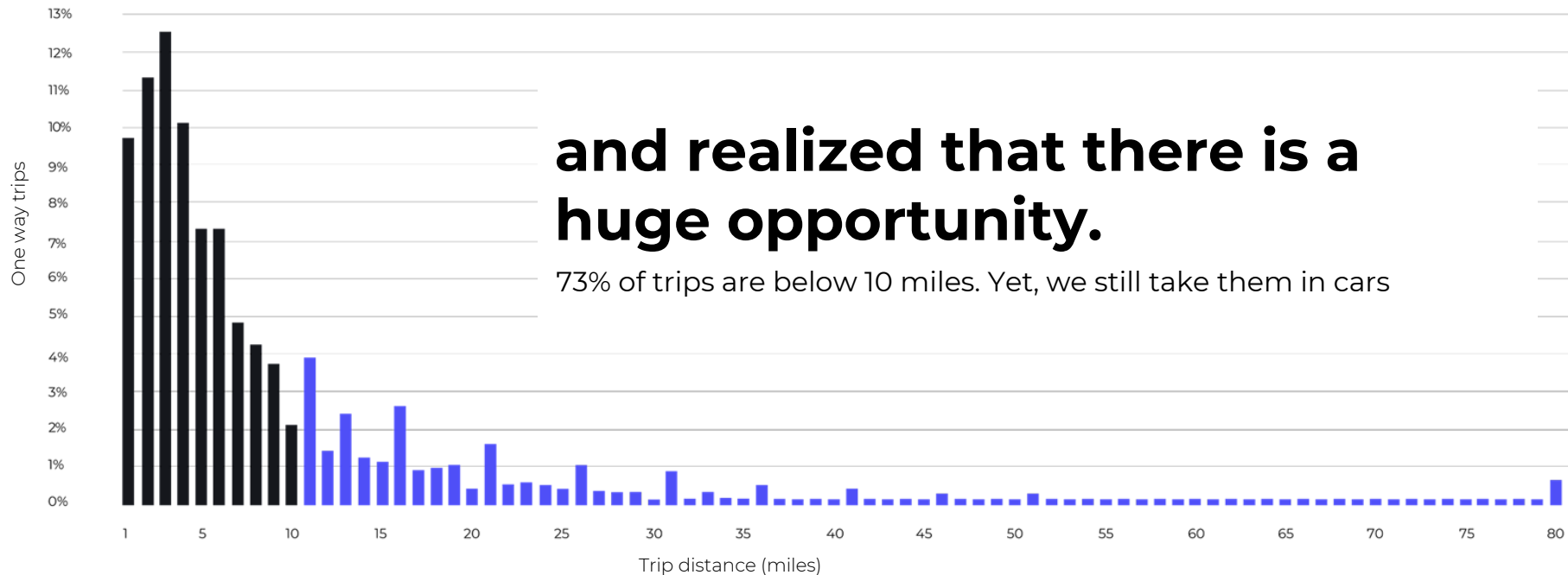


We used to build electric racing cars...

But we understood that cars are the problem

Transportation is the **driver** of the emissions





and realized that there is a huge opportunity.

73% of trips are below 10 miles. Yet, we still take them in cars



A vibrant, sunlit scene of a large crowd of people riding bicycles on a wide, tree-lined street. The cyclists, dressed in a variety of casual and semi-formal attire, are moving in different directions, creating a sense of dynamic movement. The street is flanked by mature trees with green and yellowing leaves, suggesting an autumn setting. In the background, a large crowd of people is visible, some standing and others riding, further emphasizing the scale of the event. The overall atmosphere is one of a thriving, car-free urban environment.

**We have seen a future without cars,
and it's amazing!**

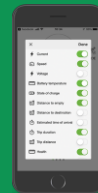
"I've Seen a Future Without Cars, and It's Amazing" by Farhad Manjoo [The New York Times](#)

"The Vehicle of the Future Has Two Wheels, Handlebars, and Is a Bike" by Clive Thompson [Wired](#)

How we do it?

One platform, various vehicles and applications

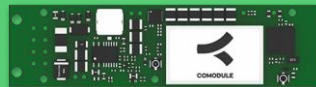
Software



IoT Service

REST API, SDK, custom WebHook, device management tools

IoT Hardware

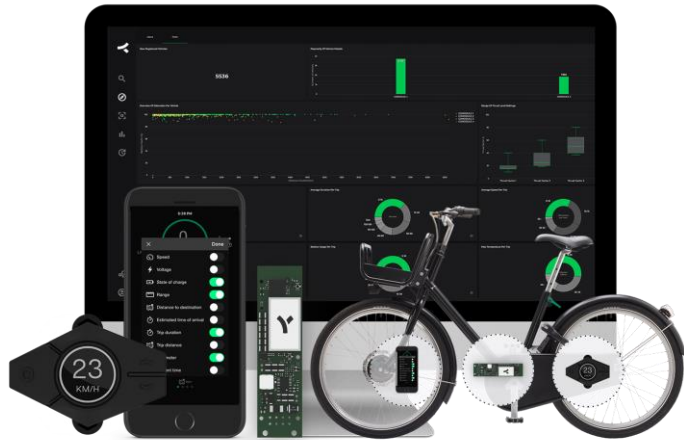


Customer Vehicle

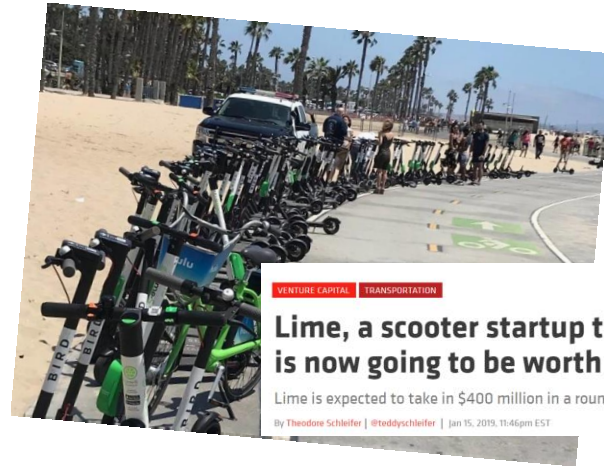


Started from e-bike manufacturers...

e-bike manufacturers



Then e-scooter boom happened



Lime, a scooter startup that barely existed two years ago, is now going to be worth \$2 billion

Lime is expected to take in \$400 million in a round financed primarily by its existing investors.

By Theodore Schleifer | @teddyschleifer | Jan 15, 2019, 11:46pm EST

Scooter Startup Bird Doubles Valuation to \$2 Billion in 4 Months

The company has raised over \$400 million in four months.

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By Rachel Sandler Business Insider

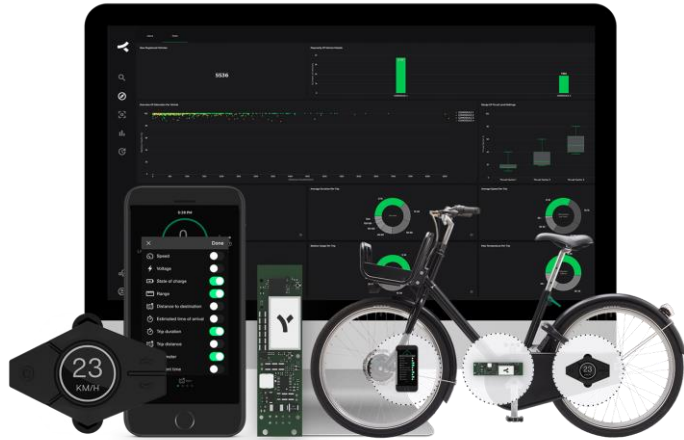
Bird is the fastest startup ever to reach a \$1 billion valuation

By Alison Greenwald • June 14, 2018

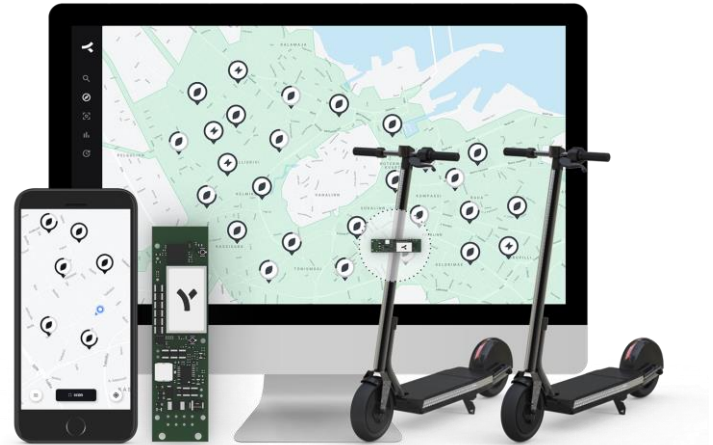


...and expanded to fleet operators

e-bike manufacturers



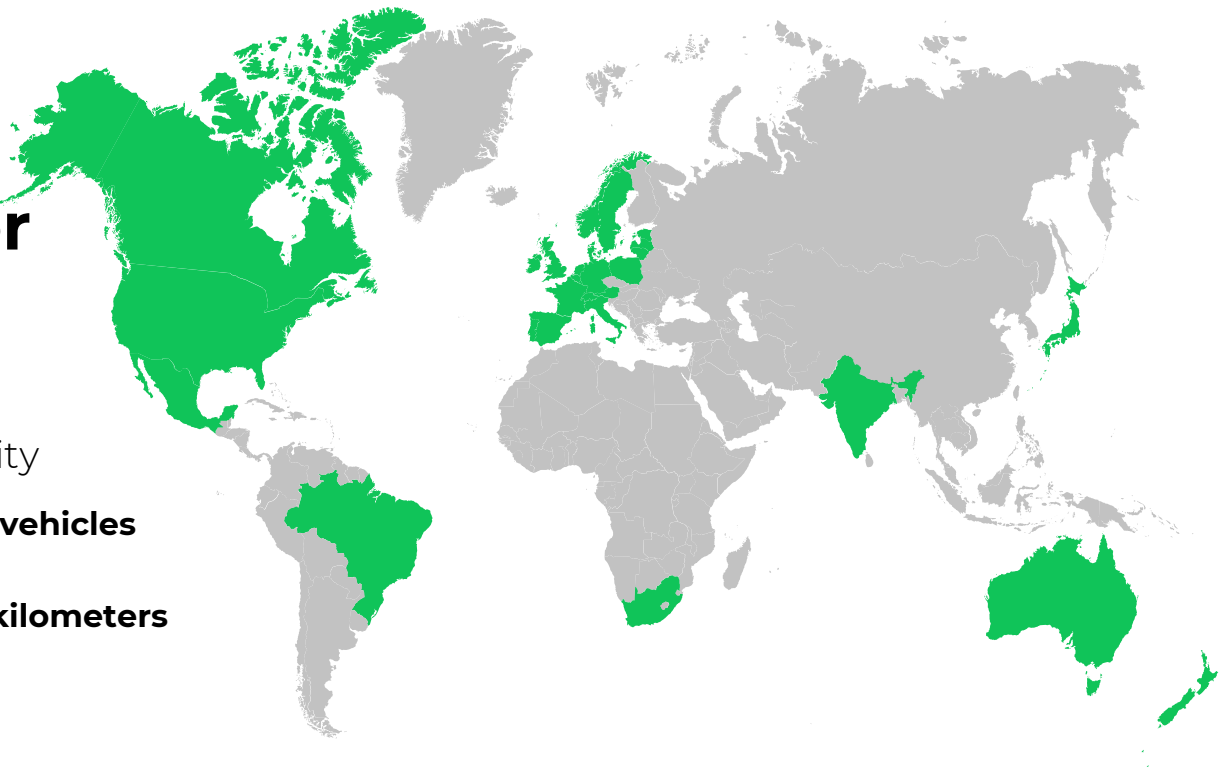
Fleet operators



Global leader in bicycle & scooter connectivity

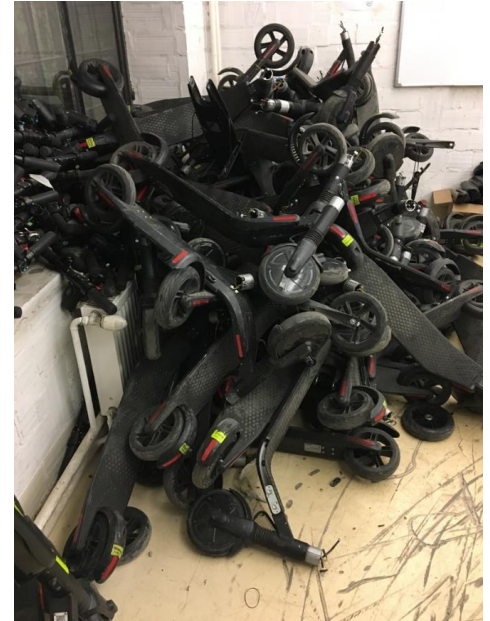
Enabling leaders of new mobility

- **45+ countries**
- **350K vehicles**
- **43 customers**
- **70M kilometers**



We had unique insights to the e-scooter rental market to understand **what needs to change**

1 The scooters do not last



We had unique insights to the e-scooter rental market to understand **what needs to change**

- 1 **The scooters do not last**
- 2 **The way they are built is far from sustainable**

Business with Chinese scooters



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- 1 **The scooters do not last**
- 2 **The way they are built is far from sustainable**
- 3 **The way they are operated is far from sustainable**



We had unique insights to the e-scooter rental market to understand **what needs to change**


- 1 **The scooters do not last**
- 2 **The way they are built is far from sustainable**
- 3 **The way they are operated is far from sustainable**
- 4 **They are uncomfortable and unsafe to ride**



Decided to take up the challenge

1 The scooters do not last 





2 The way they are built
is far from sustainable 

3 The way they are operated
is far from sustainable 

4 They are uncomfortable and
unsafe to ride 

“Hey, lets fix it!”

Key inputs to HW design

- 1 The scooters do not last 
- 2 The way they are built is far from sustainable 
- 3 The way they are operated is far from sustainable 
- 4 They are uncomfortable and unsafe to ride 

- 1 Solve the pain points
- 2 Design should be easy to iterate with low start-up costs
- 3 Functionality priority #1



1 The scooters did not last

Most durable scooter in the world

- Lifetime expectancy of **5+ years**
- **Durable and high quality** materials
- **Modular design** for easy maintenance



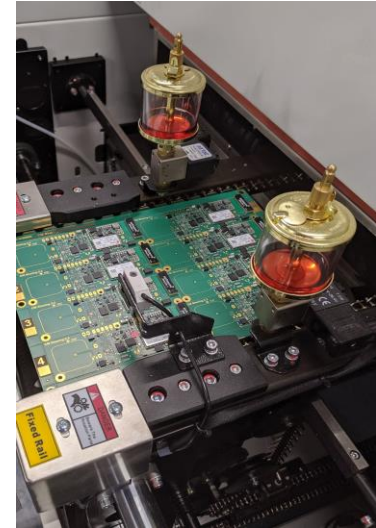
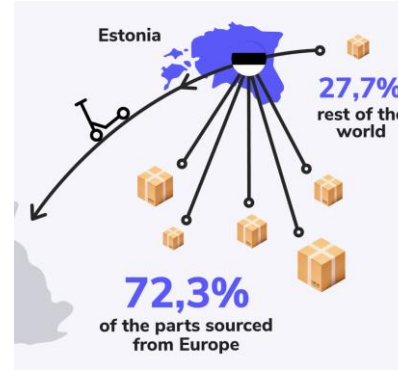
2

The way they were built
was far from sustainable

Its local

- The only e-scooter that is **developed and produced outside of China**
- **Production in Tallinn**
- **Full control** over production & supply chain

better build quality
greener production
greener supply chain



2

The way they were built
was far from sustainable

Most sustainable scooter in the world

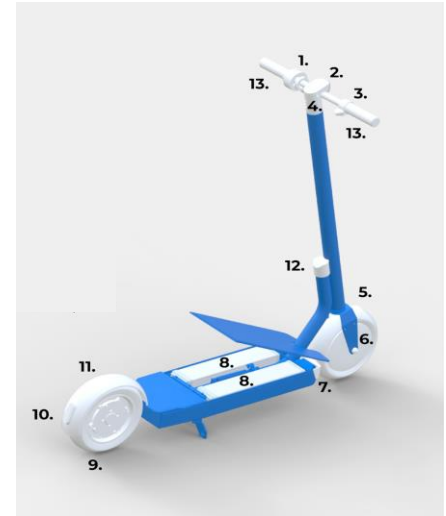
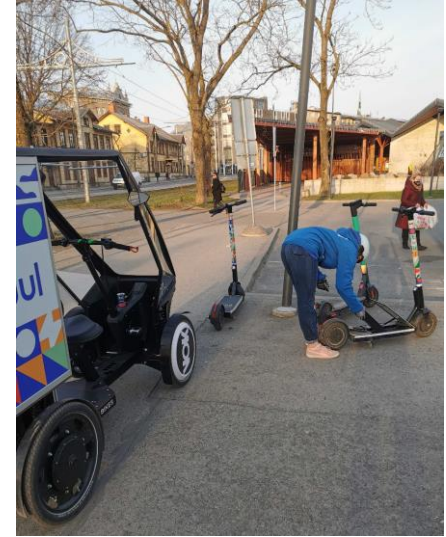
- **42% of input** materials used in production are recycled materials
- **90% of materials are recycled** at the end of lifetime
- **Renewable energy** used in production



3 The way they were operated was far from sustainable

Designed to enable sustainable operations

- **Swappable batteries**
- **Modular design** for on the street maintenance



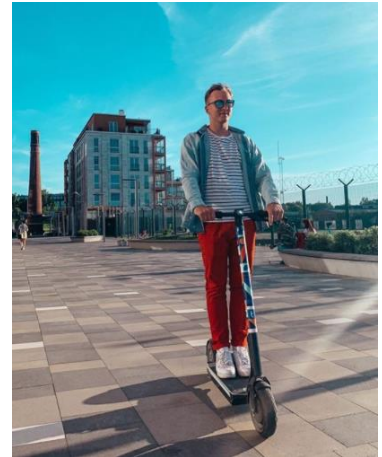
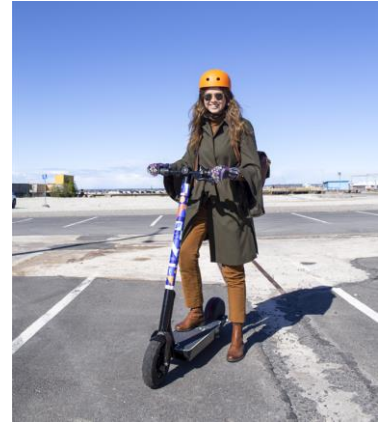
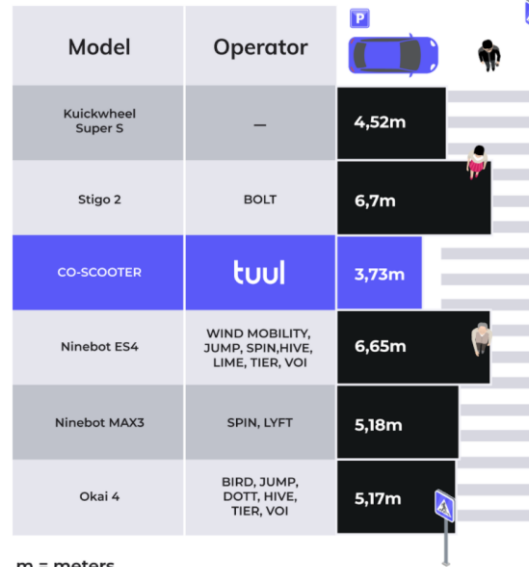
4

Uncomfortable and
unsafe to ride

The safest scooter in the world with unmatched ride ergonomics

- Shortest braking distance in the industry
- Large pneumatic tires for better grip and less vibration
- Robust steel frame for stability
- Wide standing board and low centre of gravity for better control

Braking distance comparison from full speed 25 km/h



We realised we built the best scooter in the world...

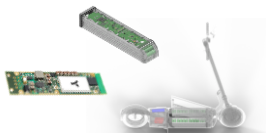
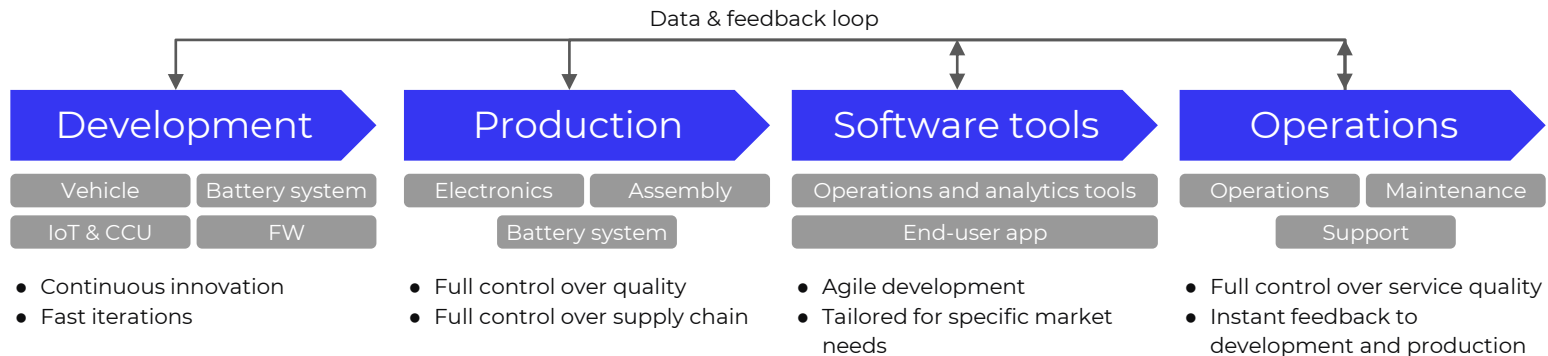
- Most durable
- Most sustainable
- Safest
- Unmatched ergonomics

...so we decided to give it a try and operate the fleet ourselves

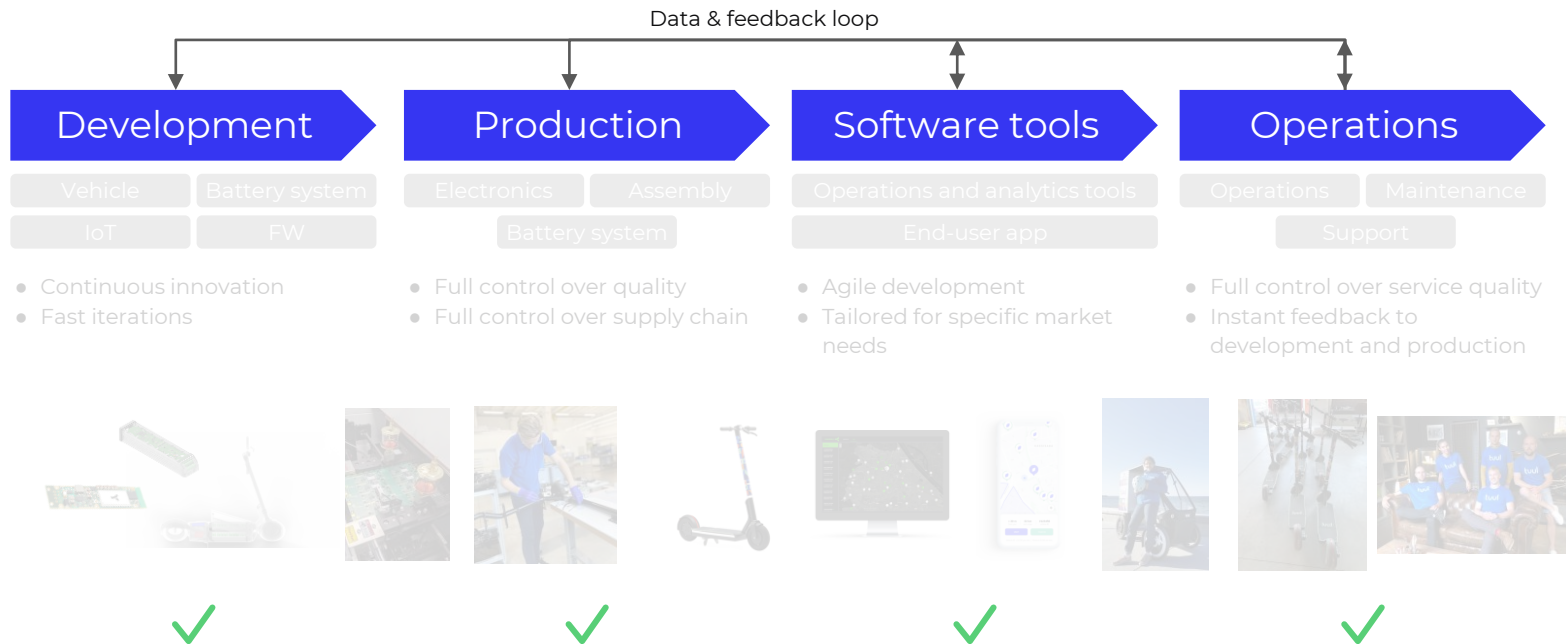
- Get feedback and validation for scooter
- Better understand the pains of operators
- Understand if operations is something we want to do longer term

**We needed to build the
brand & service**

Vertical integration, feedback loop & data driven decisions as cornerstone for continuous improvements



Vertical integration, feedback loop & data driven decisions as cornerstone for continuous improvements



voi.

×



×

✓

Often outsourced

SUSTAINABLE PRODUCT 1-2-3

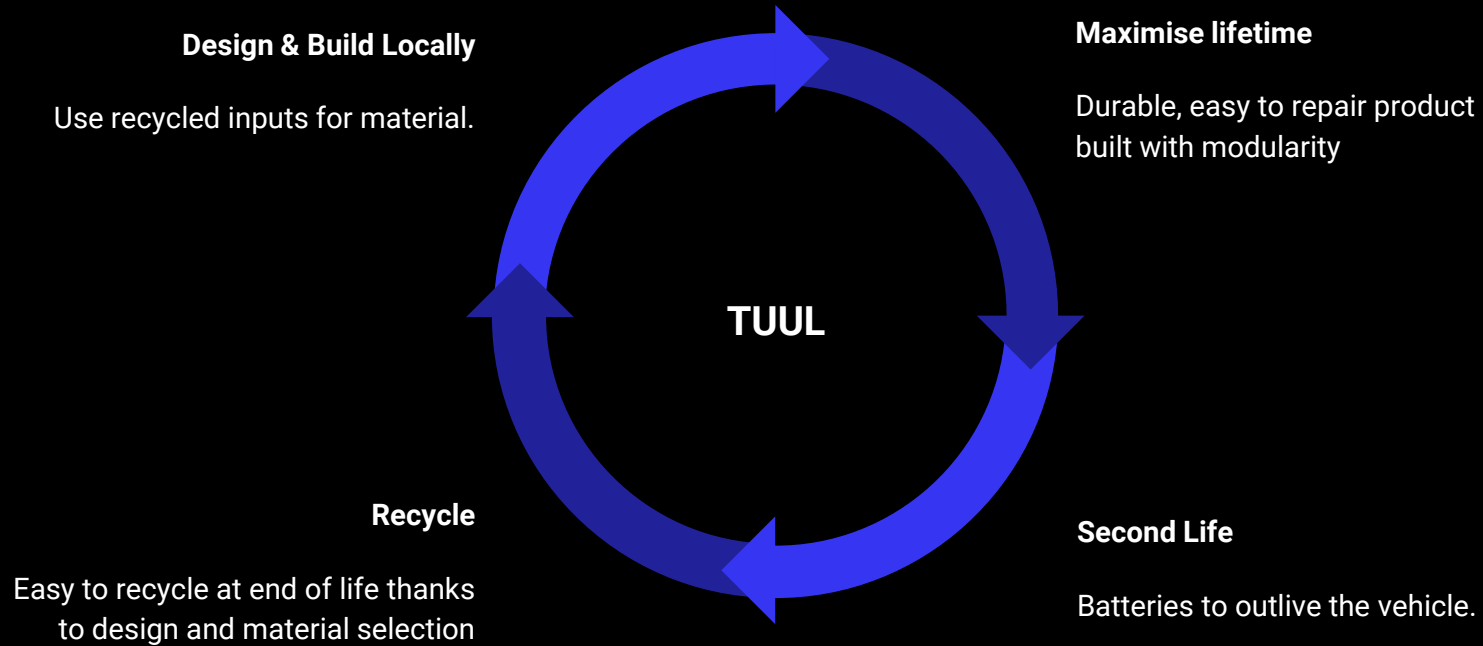
- 1) Long lifetime
 - 1) Easy to repair
 - 2) Durable
- 2) Is made locally
- 3) Has a second life and is recyclable



SECOND LIFE

- Reuse the batteries for energy storage
 - Design it in from start
 - Vertical integration creates an huge cost advantage compared to competition
- Fully functional prototype built
- Thank you for the prize money :)





VERTICAL INTEGRATION

**TIME CONSUMING
EXPENSIVE
DIFFICULT**

RESULTS TAKE TIME

**IT TAKES 5 YEARS
TO PROVE
A 5 YEAR LIFETIME**

GREENWASHING

**COMPETITION LIES
BIG TIME**

REGULATORY HURDLES

**SCOOTERS ARE THE
MOST REGULATED
FORM OF VEHICLE EVER**

Tuul Võlakiri Nasdaq Q1

Tallinna tänavatel vurasid esimesed tõukerattad: miks on Tuul parem kui eelmisel aastal tänaval olnud tõuksid? (100)

Video: Tiit Blaat
Fotoajakirjanik

Lisla Rebane
Saade ja reporter toimetaja



Sel nädalal jõudsid Tallinna tänavatele sadakond **Tuule** tõukerattast, mis on toodetud Tallinna keskkinnas.

UUDIS

Bolt sai Eestis ootamatuks konkurendiks Tuule



Harry Tuul
1905.2020 kell 09:48

[Jaga Facebookis](#)
[Saada e-kirja](#)



Tuule teenusejuht Kai-Li Merisalu uue Tuule rattaga Telliskivis FOTO: Tuul

Elektritõukeratta ja -elektrijalgratta mooduleid arendav ja tootev Comodule tegi ootamatu pöörde. Kristjan Maruste, Teet Praksi ja Heigo Variku asutatud firma hakkas ise tootma tõukerattaid ning neid rentima Tuule kaubamärgi all.



Tuul

30 May at 18:32 · 🌐

Tänane tuul lausa kutsub Tuulega õue 🌳🌳🌳 #eestituul #tuulride #visittallinn #visitestonia #scooters #lifestyle



Tuul

2 June at 13:53 · 🌐

Teeme Tallinna maailma tõukerattade pealinnaks 🚲🚲🚲🚲🚲? Unistades võime visualiseerida, et 5 aasta pärast satume tiptunnil tõukerattade ja teiste kergliiklusvahendite ummikusse, mis ei lammata heitgaasidega ega lukusta kõrvu mootorimüras. Tuul hingab selle unistuse täitumise nimel ja loodab, et muudab ka Sinu suhtumist e-tõukerattastes positiivsemaks. Eelista liigelda loodussõbralikult, eelista liigelda jagatud tõukerattaga ja anna oma panus. Koos rikastame linnaelu... See more



Tuul

27 May at 10:02 · 🌐

Tänaaset on Tallinna tänavatel @bolt_estonia, @primetallinn ja @tuulride e-tõukerattad 🌳. Rahvusvaheliste tõukerattade tervitüks on kõik sõidud Tuulel tänase keskpaevani 61% allahinnatud 🍷. Tõstame Tallinna kergliikluskultuuri uuele tasemele ja vähendame üheskoos müraaset. Jaga meiega oma kasutajakogemust, millisel tõukerattal end kõige mugavamalt tunned ning kas Sinu jaoks on tõukeratta taaskäitluse võimalus oluline? 🌳🌳🌳 #tuulride #eestituul Laadi alla Tuul: www.tuulxyz



Tuul

20 May at 16:07 · 🌐

„Et sellest aru saada, peab peale hüppama ja sõitma. Ma arvan, et emotsiooni või teenusega nii õige – sa võid seda kirjeldada, aga selleks, et aru saada, kas see on teistsugune või parem, tuleb ise proovida,“ räägib Maruste. #tuulride #eestituul



ARIPAEV.EE

Bolti konkurendiks pürgiv ettevõtja võrdleb oma teenust armastusega

👍👍👍 You, Kristel Maruste, Markus Hääl and 39 others 1 comment

👍 Love

💬 Comment

🔗 Share

