Commuting by bike

One week (240KM) on the VanMoof Electrified S

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For a few years now, I commute to work using a bicycle. I have lost more than 15KG since I stopped using my scooter. This week I tested a VanMoof Electrified S, an electric bike with an industrial, minimal design. Is it any good? How does it compare to a normal bike? Will an electric bike make you lazy? Read along to find out!

VanMoof

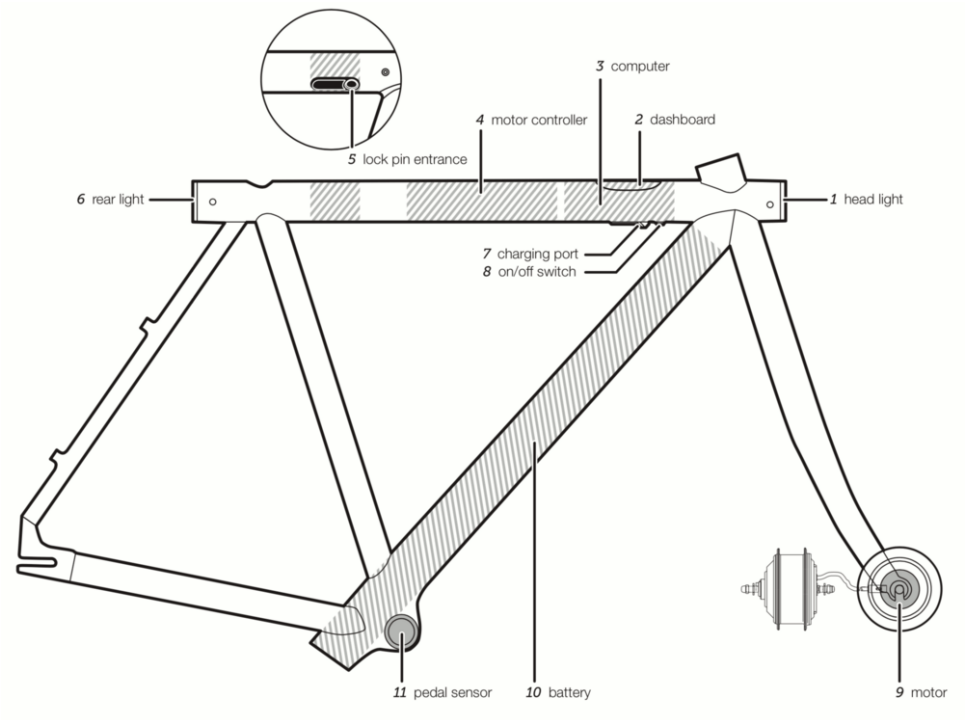
Founded by two Dutch brothers, VanMoof is focused on making the perfect city bike. Their bikes are strong, tough enough to survive life in a city. Many of the parts (80%) are designed and produced by VanMoof themselves. Their design teams sit right above the store, close to all the action and right in the middle of the city. They love their bikes.

VanMoof's founders, brothers Taco and Ties Carlier

Electrified S

The Electrified S is *the result* of all VanMoof's efforts to design the perfect bike. It's a bike designed for cities, for commuting, to get from A to B, hassle free. It has an anti-theft tracking system and integrated lights. But it's best feature is the hidden battery and electric motor.

VanMoof Electrified S - an e-bike with secret superpowers - a rocket disguised as bike



The inners of the Electrified S: the battery and electronics are cleverly hidden inside the bike's frame

The bike is available in black, grey and white, available with various options for carrying luggage. It's engine delivers 250W of power, meaning you don't need a driving license, insurance or registration plates. By EU-law the Electrified S is considered to be a normal bycicle, not a moped or scooter like the faster pedelecs are.

Specifications

- **range** 60KM (full power mode) ~ 120KM (economy mode)
- **weight** 21KG (measured with chain lock)
- **engine** 250W front-wheel hub motor
- **battery** 418WH battery, integrated into the frame
- **speed** 32KM/H in the United States or 25KM/H in EU-countries
- **charging** from 0 to 100% in 6 hours
- **size** suitable for riders of 170 - 210CM
- **tires** Schwalbe Big Ben on 28" wheels
- **brakes** front and rear mechanical disc brakes
- **lights** integrated lights powered by the battery, activated by sensors
- **chain and gears** fully enclosed anti-rust chain and SRAM automatix gear system
- **price** € 2998 (at the time of writing)

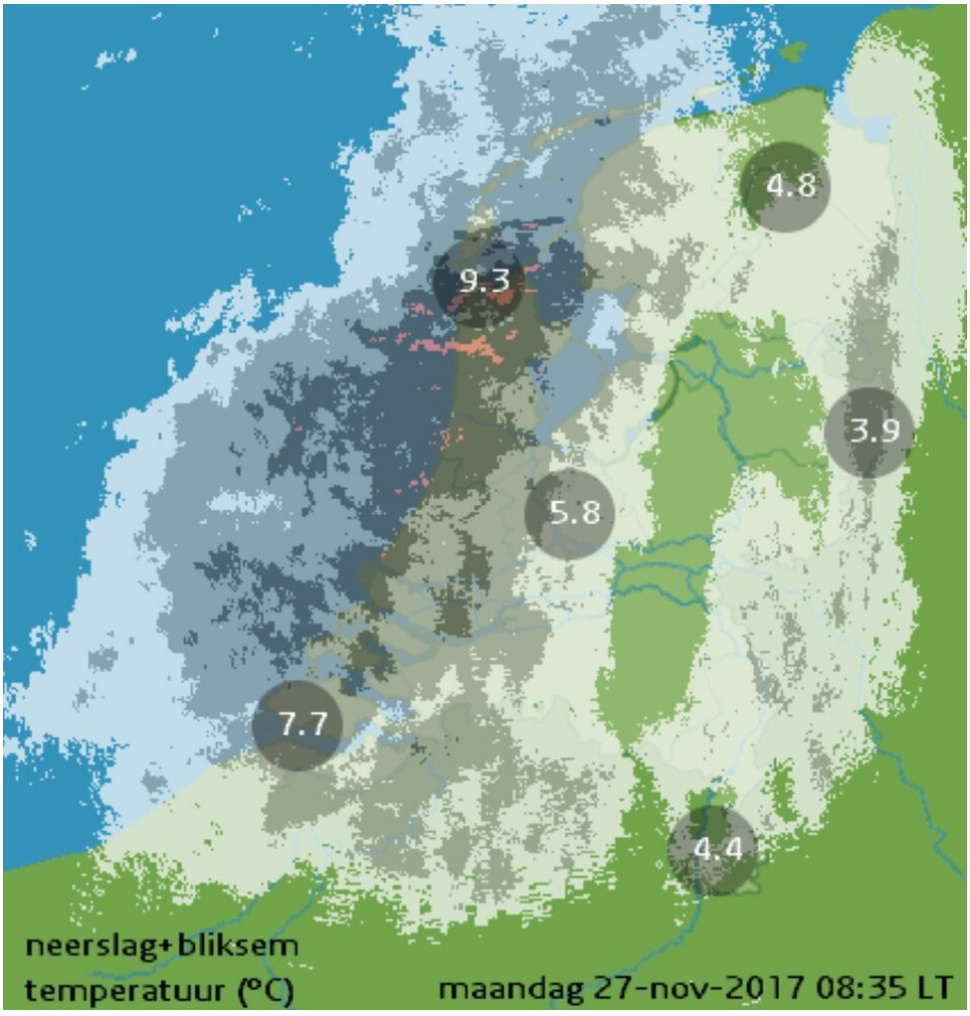
The bike's battery is the most expensive part of the bike. VanMoof indicates that the battery will last for about 1000 charge cycles (after which it will loose its capacity). Replacement batteries are available for about €600. This mandatory maintenance is something you should take into account (just like other means of transport require maintenance too).

One week on the bike...

Usually I go to work by bike, cycling about 160KM a week. Depending on the weather I use a road racing bike or a normal city bike. My commute is a 16KM ride that I complete in about 40 minutes. The route takes me through Amsterdam and the Dutch country side (with lot's of windy open fields, the so-called 'polder').

I had the opportunity to test the VanMoof Electrified for a week, riding it through and through. What could possibly interfere with me riding the perfect bike?

... in Dutch weather



Rain radar image during test riding the Electrified S (source: knmi.nl)

They say that there is no such thing as bad weather... only bad gear. Despite the rain, cold and wind I took the bike and drove it during my daily commutes.

That smile is not because of the fantastic Dutch weather... it's because of that rocket disguised as bike

The VanMoof Electrified S turns a common commute into a joyride! You go faster and more easily through the wind. That makes you smile, it really does!

Dutch bike, Dutch weather: The Electrified S handles the dark, cold and wet conditions easily!

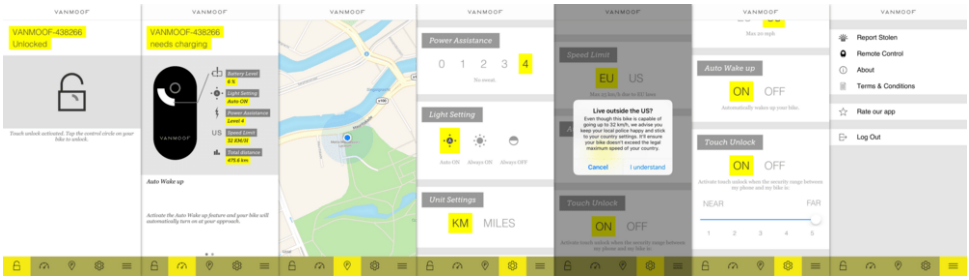
Unlocking the bike

The Electrified S is a SmartBike, it connects to your smartphone by Bluetooth. You can unlock the bike by simply touching it (it detects your presence by the signal of your phone).

Unlocking the bike using a smartphone

The VanMoof app

In addition to unlocking your bike, you can use the app the check the status of the battery, the location where you've parked it and configure things like the lights and speed.



The VanMoof app

The Electrified S is limited to 25KM/H in EU-countries. However, the app provides you the option to change that into 32KM/H or 20MPH (to comply with US laws). VanMoof recommends to keep the local police happy by sticking to your country's limits... a recommendation you can choose to ignore.

Anti-theft and ”Piece of Mind Service”

The bike has a GSM integrated into its frame, making it possible to remotely track its position. It doubles as anti-theft tracking system. Stolen bikes get tracked down. With their ”Piece of Mind Service”, VanMoof offers you the guarantee that if your bike gets stolen and it can't be recovered within two weeks, they'll replace it.

Out in the open: the Electrified S

Riding the electric bike

The bike rides like any other bike: no need to learn any special controls or tricks. The engine only kicks in when you cycle. It support your efforts, it doesn't move by itself. You can choose from 4 levels of electrical support.

Riding the VanMoof through the Dutch country side

VanMoof Electrified S

The bike is well balanced and handles well. The extra weight of the battery and engine adds to the confidence the bike gives you riding. It feels like a tank while being as agile as a roadster.

It's ease of use and the extra speed make the Electrified S a very nice bike to ride. During rush hours I very often were faster than cars and busses.

Smile inducing speed advantage over other traffic during rush hour

Steering and charging

Because of the display is integrated into the frame it is better protected against bumping into other bikes when parking the bike somewhere in the city. Right underneath the touchscreen you'll find the charging connector and a button to manually power the bike on or off.

The bike features a sporty city steer and an integrated touchscreen in the frame

The dashboard indicates current speed, battery level and engine performance

Dashboard and charging connector are integrated into the frame

The charing port is hidden behind a rubber flap.

Electric engine

The motor is integrated into the front hub. It very much looks like a normal wheel front wheel hub, only slightly larger in diameter.

Front hub electric motor

The booster button, conveniently positioned near the left thumb

For those moments that you need a little bit extra help you can use the booster button. It (temporarily) increases power from the engine.

I used it leaving traffic lights or whenever I climbed a bridge. It's useful because it allows you to use the electrical system in economy mode (for longer range) while still being able to quickly unleash the electrical superpowers.

Lights

Both lights are integrated into the frame. Like the touchscreen, this means the lights are better protected against bumping into other bikes. They are bright and do their job very well.

Front light is integrated into the frame

Rear light is integrated under the seat post

One disadvantage of the rear light is that if you use a rear carrier, child seat or a long jacket - the light gets blocked. Other bikes like the Sensa Cintura use an ILU light that is integrated in the rear mud fender. Depending on your use, that may be better.

ILU integrated light on the Sensa Cintura Belt Drive bike - it doesn't get blocked by rear luggage, child seats or a long jacket

The chain guard 'floats' around the chain: it is not attached to the frame. It's made from flexible plastic. This makes it resilient to damage.

Chain guard made from flexible plastic is resilient to damage

Gears

The bike is equipped with a SRAM Automatix two gear rear hub. The two gears have a ratio of 1:1 and 1:1.37. The bike automatically shifts up at approximately 18KM/H. This is fine when you are using the electric engine, but it makes cycling without electric support very heavy... which I found out the hard way (when I ran out of battery power).

SRAM Automatix two speed gear hub - hate it or love it

A manual gear system (like the Shimano Alfine) gives you more gears and would make the bike nicer to ride with less or no electric support. The Electrified S would benefit if VanMoof would offer this as an optional upgrade.

Tires and brakes

The bike comes with Schwalbe Big Ben tires. As the name suggests, these are big fat tires. They are nice, give the bike great traction and limit the chance you get stuck in tram rails...

Big Ben tires from Schwalbe

The mechanical disc brakes have no trouble stopping you

In combination with the enormous grip the Big Ben tires provide, the mechanical disc brakes do their job well. The bike brakes very well, even in wet conditions. On a fast electric bike this is no luxury, but an absolute must!

Carrying things around

The bike I tested only had a small luggage compartment used for the chain lock. You can opt for a front or rear carier.

Lock chain inside a small luggage compartment

The optional "bambooman" front carrier can be quite handy (photo from another bike, my VanMoof S5)

Range and running out of power

When using the most powerfull setting, the bike has a range of about 60 kilometers. During my week I ran out of power once, after 55KM, in heavy wind, the engine stopped.

That was not a problem, lights and the bike lock still functioned and I continued home using manual pedalling power only (comfortably riding at 22KM/H).

Test: Electrified vs normal bike

One thing I immediately noticed was that it is much colder on the electric bike (compared to a normal bike). I quickly figured this is because I am going faster and I am doing less. This is easily solved by a good pair of gloves and a warmer jacket, but it made me wonder: would I become lazy using the e-bike?

Measuring heart rate

I decided to find out how much less effort my body had to deliver when riding the e-bike. In order to find out, I decided to compare the Electrified S to a normal bike, another similar VanMoof, but without an electrical engine.

Normal (non-electrified) vs Electrified bike

Using a waist worn heart rate monitor, I measured how much work my own body did. Higher heart rates indicate more physical effort.

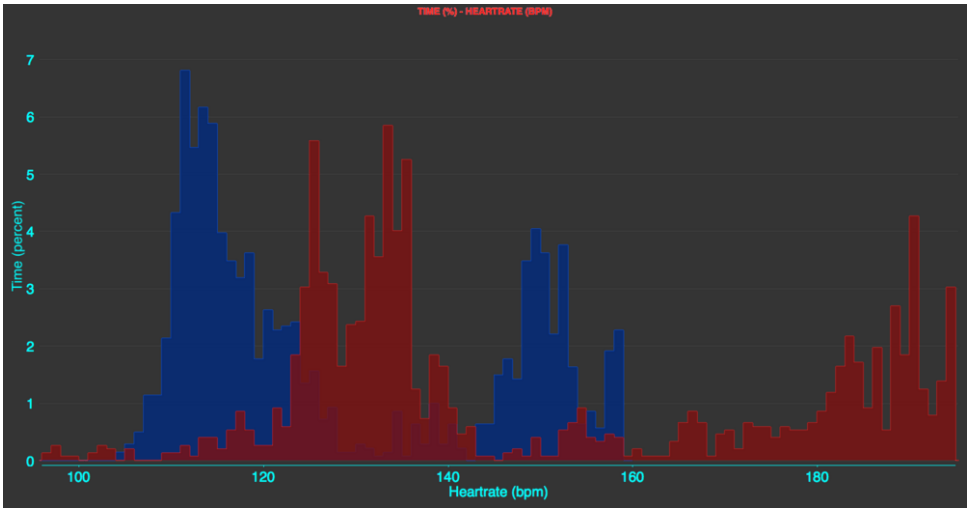
Using the Cyclemeter Pro and a Wahoo Tickr I measured speed and performance during the test

I drove both bikes over a nearby circuit with roads in all directions (compensating for wind). Between laps I rested long enough for my heart rate to go back to rest. I did two laps on each bike: one "easy riding" at ±20KM/H and one "full speed" at ±30KM/H.

Measuring heart rate at different speeds on both a normal and electric bike

- **lap #1**: Non-electrified at ±20KM/H ~ 130BPM
- **lap #2**: Non-electrified at ±30KM/H ~ >180BPM
- **lap #3**: Electrified at ±20KM/H ~ 110BPM
- **lap #4**: Electrified at ±30KM/H ~ 150BPM

It is not surprising that your body is working harder on a normal bike. At full speed, this is really intense, you'll get tired quickly. My heart reached rates up to 195 BPM, considered very high for somebody of my age.



Histogram of time and heart rate, showing how long (% of total time) a given heart rate was measured. (blue is electric, red is normal)

The test shows that if you ride slowly on an electric bike, you're not working out that much (indicated by the very low heart rate). But at higher speed you are in fact still working out!

Conclusion

After one week with the VanMoof Electrified S during which I cycled about 240KM, I can say that this is in fact a very good bike. Commuting to work on this bike is fun. It's speed advantage gets you from A to B faster, its powerful engine saves you any sweat.

The electric advantage makes commuting on this bike much easier and less of a physical effort. All of this while your body still burns calories. If it works for you obviously depends on where you live, but I definitely recommend anyone to try!

In case you're still in doubt: electric mobility is the future and is here to stay.