evovelo

mö : technical specification

mö is a solar bio-hybrid vehicle for the everyday commute. Practical, agile and versatile, it's an innovative and ultra-efficient urban vehicle. It combines the advantages of a car such as safety, weather protection and comfort, with the low energy consumption and space utilisation of a light electric vehicle. Using a socially responsible highly cost effective management system, its design takes into account the durability of materials and systems, with priority on: safety, sustainability, maximum longevity, reliability and low maintenance. It represents a very real alternative to private transportation in urban and peri-urban areas and its versatility can extend to tourist, leisure and institutional sectors of any size.

mö is classified as a EPAC (EU) making it both road & bike lane legal and can be driven without a license. The QS electric motor can give over 1500W of max power, with a max speed of 45Km/h* and can be operated through assisted pedalling. It can ascend slopes of ≥14% on electric mode only and of ≥17% on electric mode + pedalling.

mö has a fully enclosed, stable, monocoque structure, with front crash crumple zone and side impact protection. Hydraulic brakes with EBS (ABS equivalent) and seat belts have been installed for safety. It is designed with optimised visibility along with a full set of lights, to see and be seen.

mö has an integrated SunPower solar panel of ≥200W and a Panasonic removable lithium (LiIon) battery of ≥1300Wh (48V, ≥28Ah) that provide a range of ≥40-50 Km electric on mode only and ≥50-70 Km on electric mode + pedalling.** When exposed to light, the built-in solar panels charge and restore energy into the removable battery, even when not in operation, so that 1 hour of solar charge, moving or parked, can restore 5-10Km of range*** into the battery. If daily commuting distances are around 20-30Km per day in good (moderate to high) sunlight conditions, accompanied by re-generative braking and pedalling, means no additional charging will be needed. You can expect to drive over 5.000 Km a year on solar power alone, even in the worst case scenarios of low sunlight.***An optional secondary battery can be installed, which works in parallel with the main battery, to increase range.

When daylight is low or not accessible or longer ranges are needed, mö can be plugged to the mains via its integrated external connector in order to charge the battery. The battery can also be easily removed and brought to electric mains for charging in the home, office, garage, charging station or wherever suitable. The battery can be fully charged from empty, via electric mains in 6-8 hours.****

mö can use 2 x ≥200W chargers, one internal (permanently installed) and another optional and removable internal/external that can be used externally to charge the battery or batteries. Both chargers can operate inside the mö and charge the batteries at the same time. This will provide a quicker 2-4 hours charging time****

mö's easy entry-exit ergonomic and great interior comfort consists of 2 adjustable seats (side by side) and a back cargo area which comfortably allows for the installation of 2 small child safety seats. mö weighs around 100Kg (not including extras) and has a maximum cargo weight capacity of 210Kg (310Kg total combined weight capacity).

Steering and controlling vehicle functions are via a centred multifunction joystick which makes manoeuvring easy and mö's compact dimensions (W 1.4m x L 2m x H 1.3m) allow for remarkably convenient parking in urban areas.

During hot weather, the side doors can be easily removed within seconds for more fresh air and open driving.

mö has a KT programmable motor controller 25 – 40A with reverse function, 5 electric gears, automatic regenerative braking, and an EBS (similar to ABS for electric vehicles). With an optional LCD screen which gives information to the driver regarding speed, distances, battery state, times, etc. Along the electric gears, mö has a mechanical internal gear box system that provides 3 mechanical gears for pedalling. The pedal motion is transmitted to the rear wheel by a belts system. Both passengers can pedal simultaneously or one pedals and the other don't. Hydraulic drum brakes feature on the front wheels, and electric brakes on the rear wheel. These 3 systems, the internal gears, the belts transmission system and the drum brakes make the vehicle almost maintenance free.

There will be online technical support by means of assembly/maintenance manuals and help via forums and groups online. Screws and adhesives are used to fasten mö parts, and no 'special' or bespoke tools are needed for assembly or maintenance which make repair and customisation easy. Various additional features and add-ons will be made available for sale. The design information will be licensed Open Source Hardware and/or Creative Commons for Open Innovation.

mö has a minimal environmental impact not only because it's close to "net zero energy" solar vehicle but also due to the use of sustainable materials (bio-based and/or recyclable). These materials include light plywood (UV protected, moisture-proof, rust-proof, and laminated on both sides), transparent plastic for windows (high impact and anti scratch polycarbonate Margard PC), coloured plastic for the remaining parts (Polypropylene PP recycled and recyclable plastic) and considerations and guidelines will be offered for 'end of life' or unwanted parts. Efficient manufacturing processes and the distribution of kit form vehicles to distributors will significantly reduce the environmental and economic impact of transportation. Clients will be linked up to local distributors and maintenance services in order to receive turn-key vehicles (assembled and ready to run) or kit form (flat pack for the DIY enthusiasts). Finally the cost efficiency of mö includes minimum purchase and maintenance costs, insurance and tax savings and clean energy independence.

*Nominal continuous/ max power and speed can be modified via software in order to accommodate the vehicle to different national legislations (i.e. 250W continuous-motor assistance up to 25Km/h for UE, 500W-750W-20mi/h max. speed for US, etc.)
**Range according to current tests: 30-75 Kilometres.
***Solar Charging is mainly influenced by: light, latitude, season, temperature, battery state, vehicle orientation and shades.
****Charging from mains is influenced by: mains voltage, temperature and battery state.

Vehicle Classification (Certification)

- EPAC type (EU)
- Road & bike lane legal
- Can be driven without a license

Safety & Security

- Fully enclosed and lockable to protect occupants and cargo from damage, theft and weather
- Monocoque structure acts as passengers safety cage
- Front crash crumple zone & side impact protection
- Hydraulic brakes, front low maintenance drums and electric brake system EBS (ABS equivalent) on rear
- Safety belts
- Full lighting systems: 'position light', high and low beam, brake lights, turning blinkers, rear light, emergency light
- Reflectors, front, rear and sides for high night visibility
- Highly visible on open road
- Good driving visibility
- Side view mirrors
- Steering via joystick which avoids risk of injuries in the event of collision
- Wheels: 2 front and 1 rear, provides increased driving stability
- Klaxon horn for attracting attention
- Other safety features: Key needed to operate, can be hooked to chassis or wheels, PIN code can be used for extra safety, alarm and GPS tracker can be added as option

Dimensions & Weight

- Dimensions: W1.4m x L2m x H1.3m
- Vehicle weight: 100Kg (not including extras)
- Cargo weight: 210Kg maximum
- Passenger capacity: 2 people side by side (including driver)
- Cargo capacity: back cargo area for load or 1 to 2 small child seats
- Cargo space: ≥0.6m³
- Doors: 2 side doors + rear trunk door
- Wheels: 3 tricycle, aluminium rims
- Tires: Schwalbe 20" overall diameter

Motor Power & Speed

- Motor type: direct drive (QS motor)
- Continuous/Max Power: 1000/1500W*
- Max speed: 45Km/h*
- Max slopes: ≥14% electric mode only, ≥17% electric + pedalling
- Controller: KT Programmable, 25 – 40A with reverse function
- Re-generative braking
- 5 electric speeds
- 3 pedaling gears (Shimano gear box)

*Power, speed and other parameters can be modified via software in order to accommodate the vehicle to different national legislations

Battery, Solar panel & Range

- Solar panel: SunPower integrated ≥200 W
- Battery: Panasonic removable lithium (LiIon) ≥1300Wh (48V, ≥28Ah)
- Range: electric mode only: ≥40-50 Km*
- Range: electric + pedalling: ≥50-70 Km*
- With optional second battery ranges ≥90Km

*Range according to current tests: 30-75 Km

Charging & Charge Times

- Solar charging time: 1 hour of sun ≈ 5-10Km (mö charges while moving or when parked)*
- Electric mains charging time: Normal charge 6-8 hours with from empty Internal charger (≥200W)**
- Electric mains charging time: Quick charge 2-4 hours from empty with optional removable internal/ external charger (≥200W + ≥200W)**
- External vehicle mains charging port
- Brakes: When braking while driving the re-generative braking system recharges the battery.
- When daylight is low or not optimal, the battery can be easily removed and charged through electric mains wherever suitable
- Estimations: When daily distances are around 20-30Km per day and in sunny conditions, charging via electric mains will not be needed

*Solar Charging is mainly influenced by: light, latitude, season, temperature, battery state, vehicle orientation and shades
**Charging from electric mains is influenced by: mains voltage, temperature and battery state

Driving experience

- Multifunctional Joystick driving system located in the middle, where the driver can control all vehicle functions
- mö can be driven right or left handed, with just a simple modification
- Motor Controller: KT Programmable, 25 – 40A with reverse function, and regenerative braking
- LCD screen gives information to the driver regarding speed, distances, battery state, times, etc.
- Suspension: front wheels - MacPherson, rear wheel - Lying arm
- Light exercise during use by pedalling
- Both passengers can pedal simultaneously or one can pedal and not the other
- Efficient parking with little space required (length ≤ 2m)
- Ergonomically accessible: easy entry and exit
- Comfortable and adjustable seating distance
- Large cargo area*
- Auxiliary systems: Lights, Klaxon horn, door locks, Side view mirrors
- Foldable windows "2CV" type

*Installing child seats will reduce cargo space

Assembly, Maintenance & Customisation

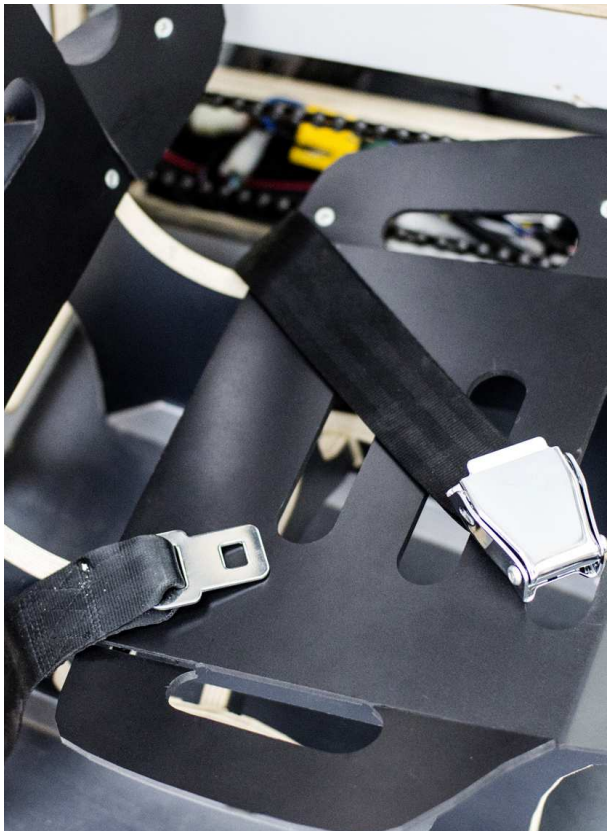
- Distributed as a turn-key vehicle or in kit form
- Online technical support and assembly-maintenance manuals
- Simple assembly, maintenance & customisation
- Kit contains all screws and adhesives to fasten parts, no ‘special’ or bespoke tools needed
- Various additional features and add-ons available
- Design and information will be licensed Open Source Hardware and/or Creative Commons for Open Innovation in the future

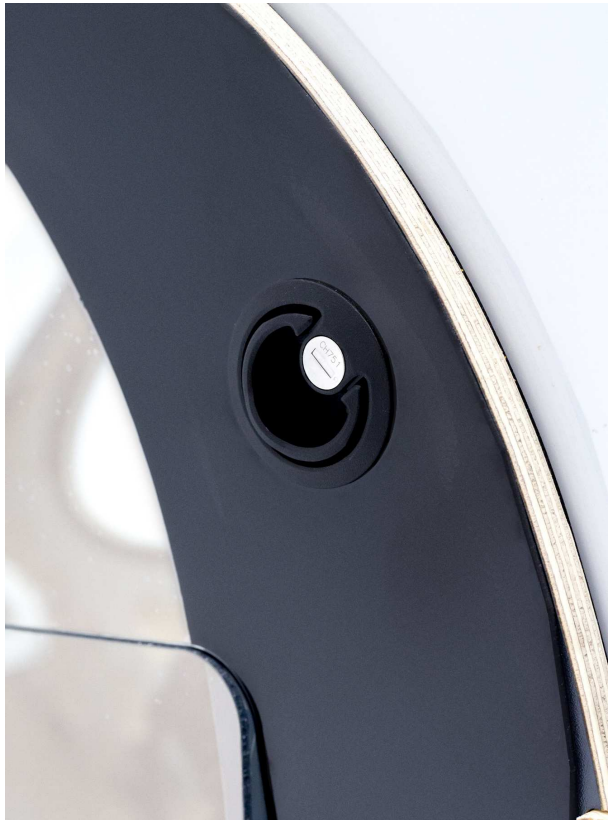
Cost Efficiency

- Minimum purchase and maintenance costs
- Low Insurance and tax cost due to vehicle type
- Energy independence (during sunny conditions)

Sustainability

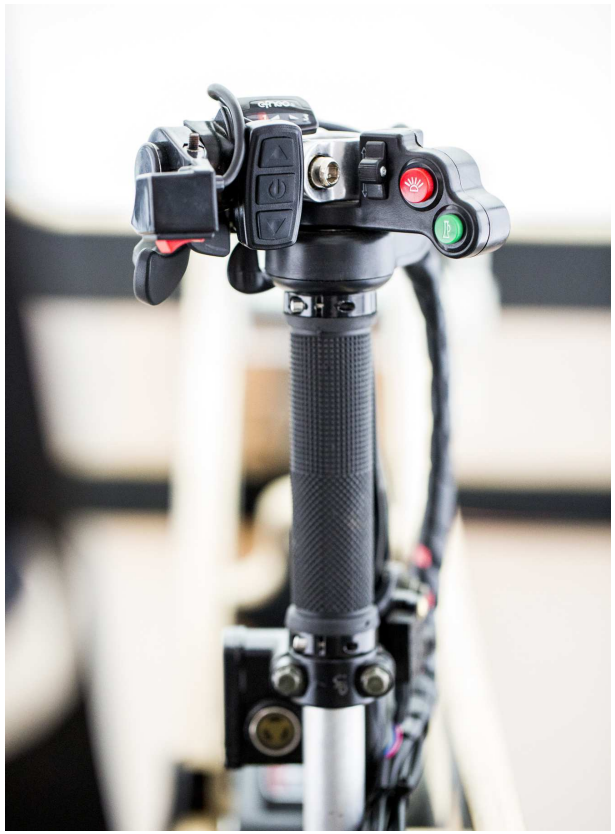
- Nearly meets “net zero energy”
- Sustainable structure and panel materials, bio-based and/or recyclable: plywood FSC certified, UV protected, moisture-proof, rust-proof, laminated on both sides, transparent plastic for windows (high impact and anti scratch Lexan PC) and coloured plastic for the remaining parts (PP recyclable plastic)
- Efficient manufacturing processes
- Considerations and guidelines for ‘end of life’
- Local distribution strategies for turn-key and/or kit form vehicles reducing environmental and economic impact of transportation
- Can improve health of user by light consistent exercise
- Can improve local economy by creating business and jobs

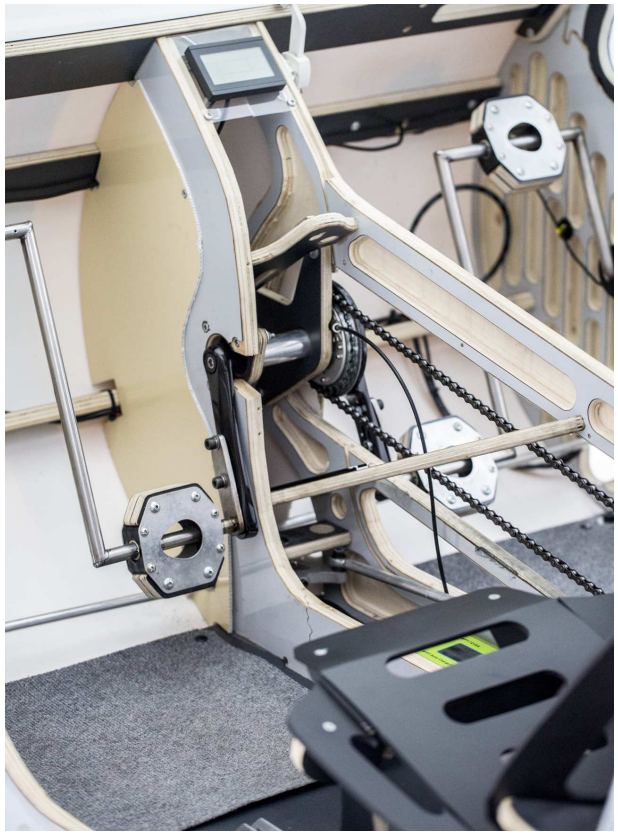





SCHWALBE
BIG APPLE PLUS


ASSIST
Km/H
MOTOR
DST
Km





Possible extras for mö:

Interior light
Light interior mats
Seat covers
Baby seats supports
Baby Seats
Outside cover
Secondary Battery
LCD screen
Bluetooth connection to controller
Internal/External secondary charger (Quick charge)
Doors glovebox
Glovebox in central "dashboard"
Windshield wiper/washer
Alarm/immobiliser
Cup-Holder
Seats heating system
Forced air ventilation
Sunroof (No compatible with solar panels)
Cable and program for updates
Music system
Parasols
Hood protector
Life warranty battery reconstruction
Bike carrier hooks
Roof/side/front rack
Motorised trailer
Internal central mirror
Vertical Parking
Toolbox

Tire repair kit
Jack or other lifting system for maintenance
Windshield data projection (HUD)
Thump Throttle
Detachable doors
Luggage compartment lids divider
IR windows protection
Tinted windows
Isolation and noise dampener panels
Charging USB connection for Phone/Pad/GPS (USB)
Phone/pad support
Remote geolocation and data system
Fog lights
Towing/Anchor hook
Pet/s anchor point/s
Cargo anchor points

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evovelo is a company which it operates within the framework of the social economy and consists people who have combined their knowledge and expertise to develop a new concept vehicle. evovelo design and manufacture vehicles for independent mobility and which minimize the exploitation of material and energy resources.

Version: V.1.2

evovelo reserves the right to make changes at any time, without notice, to these specifications and others that may be not included here.

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