

A photograph of the Aurora Borealis (Northern Lights) in a dark night sky. The aurora displays vibrant green and purple hues, flowing across the sky above a dark, silhouetted mountain range. The foreground shows a dark landscape with some distant lights.

NEVS

Elektrisk drivlina i NEVS elbil

Göteborg 2017 05 17 Magnus L Johansson @Kraftforum @Chalmers

To shape mobility
for a more sustainable future



In a world hurt
from emissions,
we want to make a
difference

NEVS

NEVS was founded in 2012 with a combination of the Swedish engineering heritage and the Chinese entrepreneurship in the green energy sector



Global Locations



Trollhättan Plant and TDC



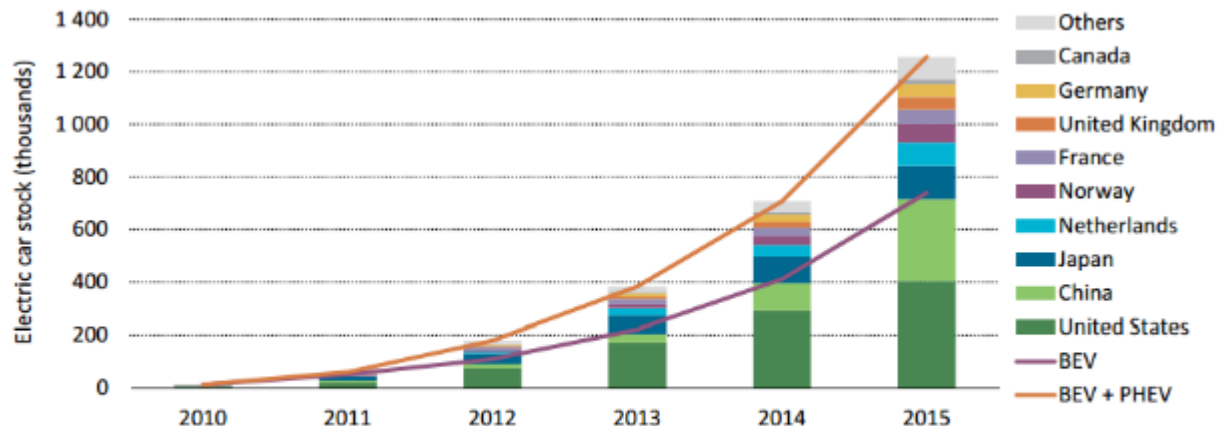
Tianjin Plant and R&D center



Beijing office and Brand Experience Center



New Longma Plant and R&D center



Note: the EV stock shown here is primarily estimated on the basis of cumulative sales since 2005.

Sources: IEA analysis based on EVI country submissions, complemented by EAFO (2016), IHS Polk (2014), MarkLines (2016), ACEA (2016a), EEA (2015) and IA-HEV (2015).

EV market is getting closer to local tipping points

“In China the EV sales were up 162 % in the first half of 2016 compared to 2015”

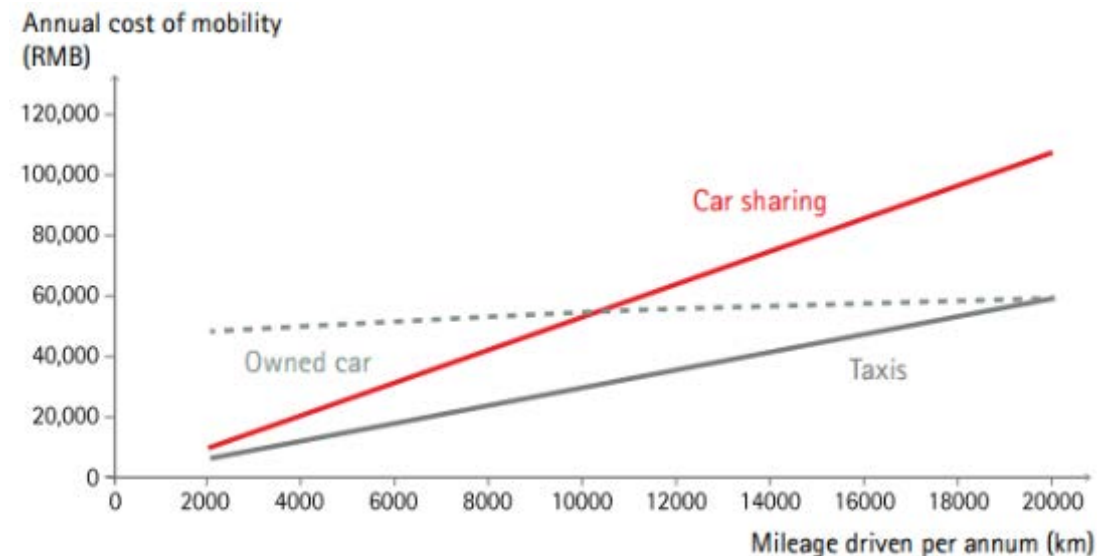
- Forbes

2016

Increased awareness of cost benefits of shared cars

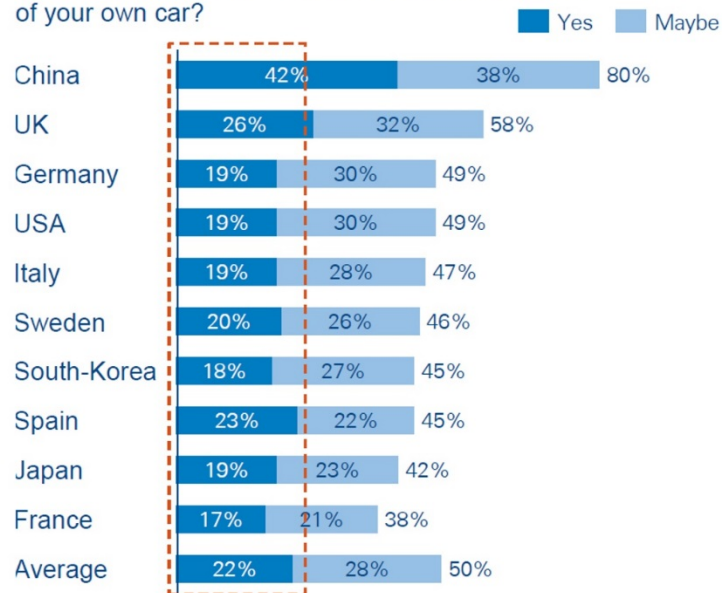
For a typical car priced at RMB 300,000 as with an annual driving mileage below 10,000 km the total travel cost will be lower compared to purchasing the vehicle.

Accenture, 2016



China is the most positive country to switch ownership for shared

Question: If there were appropriate car sharing and new mobility services would you consider to get rid of your own car?

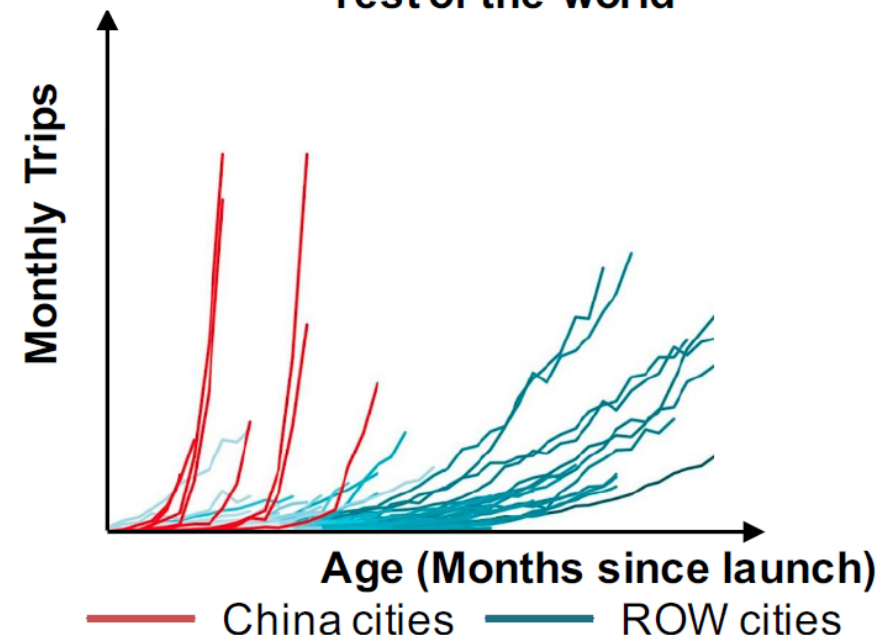


Source: Arthur D. Little analysis¹

¹ Arthur D. Little's survey was conducted with over 6,500 customers worldwide



Growth of Uber's monthly trips in different cities in China and the rest of the world



Overall average of 50% of the respondents answered positively.

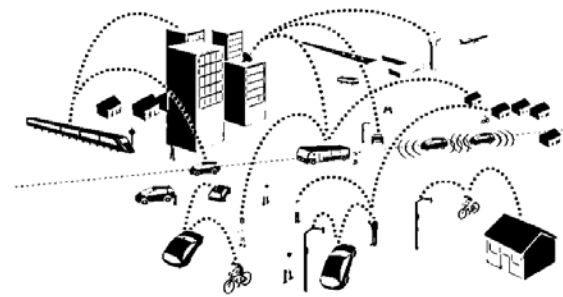
ADL survey 2016

NEVS -

Megatrends drive changes

Green is the
new status

Seamlessly
connected



Sharing
economy

Autonomous
driving



NEWS -

Open up the playfield

The established
car makers
vs
The new
entrants



NEVS Business Plan

The timing is right now

NEVS



Autonomous driving is
coming earlier than
expected

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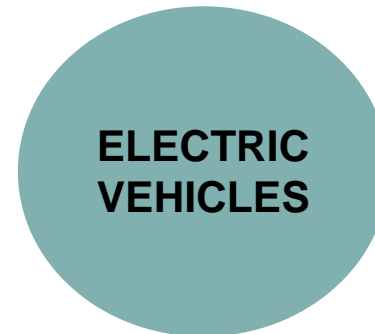
A unique position

**Aim at where
we want to be,
not what we
have to
change**



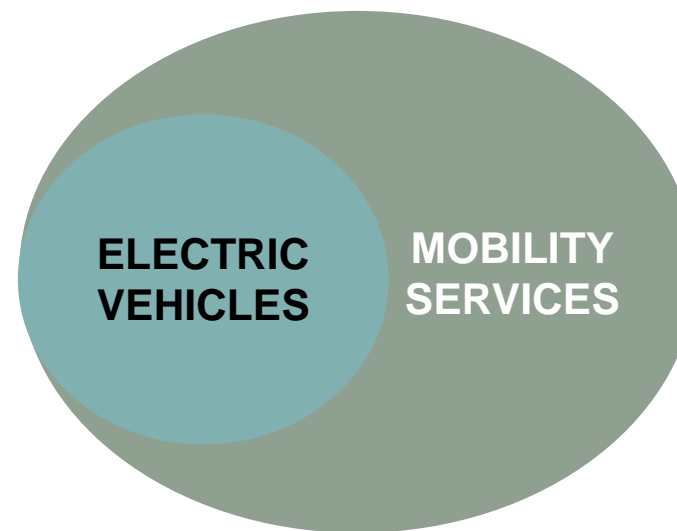
**The Swedish
car-making
heritage and
the
opportunity to
the biggest EV
car market in
the World**

To create sustainable
solutions
not only on products,
but also on service
and system levels



CARS
Premium cars

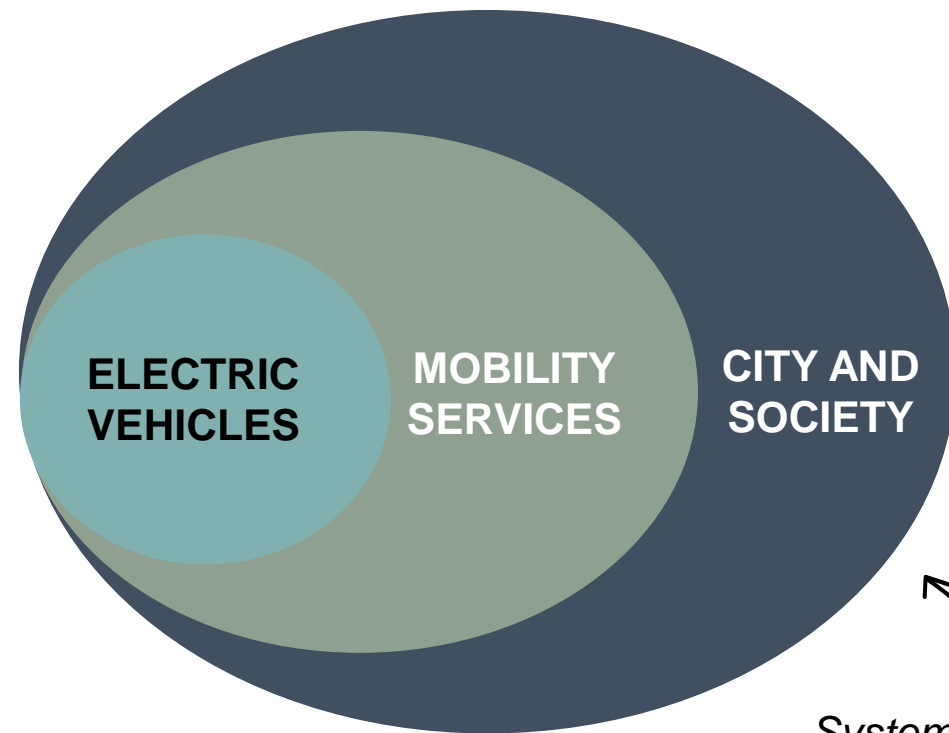
To create sustainable solutions not only on products, but also on service and system levels

**MOBILITY SERVICES**

- Financial services
- Car sharing and connectivity solutions
- Integrated mobility service

Meet the needs of an increasing amount of customers

To create sustainable solutions not only on products, but also on service and system levels



SUSTAINABLE CITY OFFERING

- Analysis of city goals for mobility
- Data collection
- Sustainable city infrastructure

System solution for cities to make a difference

A portfolio of
optimized electric cars
in combination with
mobility
experiences

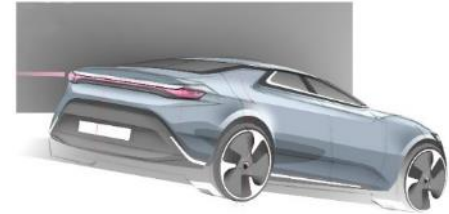
The
CORPORATE SEDAN
Midsized sedan



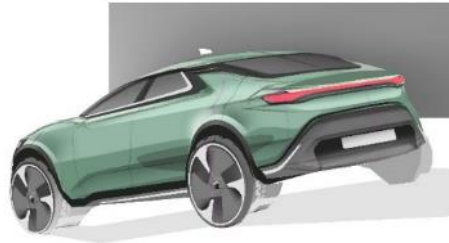
The
DISTINCTIVE FAMILY SUV
Midsized SUV



The
ACTIVE ALL-ROUNDER
Midsized fastback



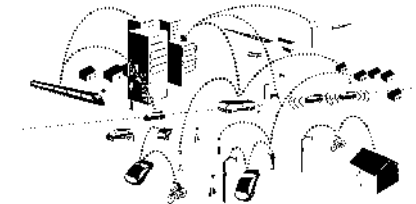
The
URBAN ADVENTURER
Midsized crossover



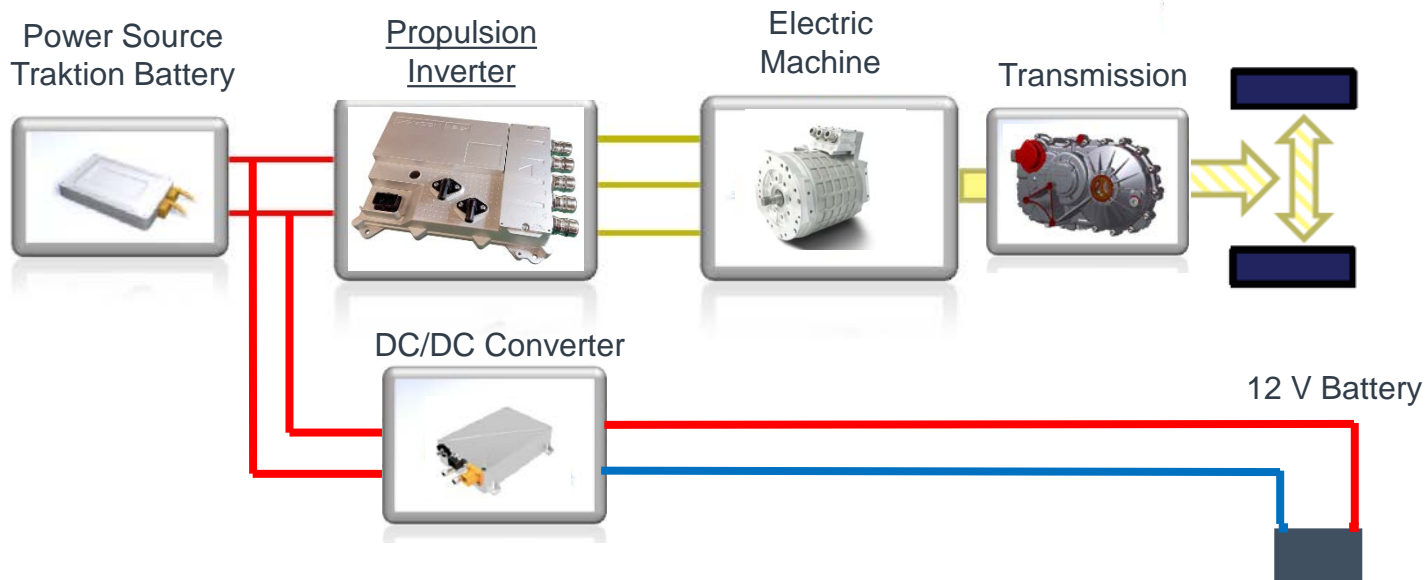
The
SPORTY URBAN SUV
Compact SUV



The
MOBILITY SERVICES



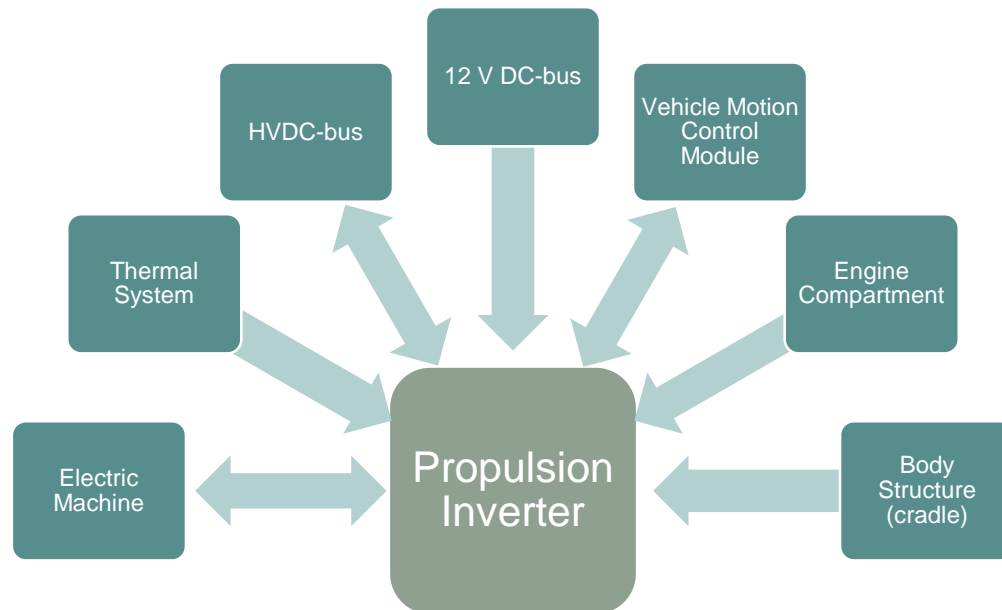
Electric Powertrain



Inverter Functions

- Actuate the request vehicle motion controller, which interpret request from the driver, to control the vehicle in the expected way. Control the electric machine is used to either accelerate or decelerate the car.
- Convert between electrical DC current from the battery pack (Rechargeable Energy Storage System, RESS) and electric machine AC current. The regenerative effort is a critical factor in range and relative energy efficiency of the vehicle.
- Acts as a smart actuator to the vehicle motion controller, which interests and executes the drivers requests. In doing so, it measures the state of the electric machine and itself to determine how much current be provided.

Interface

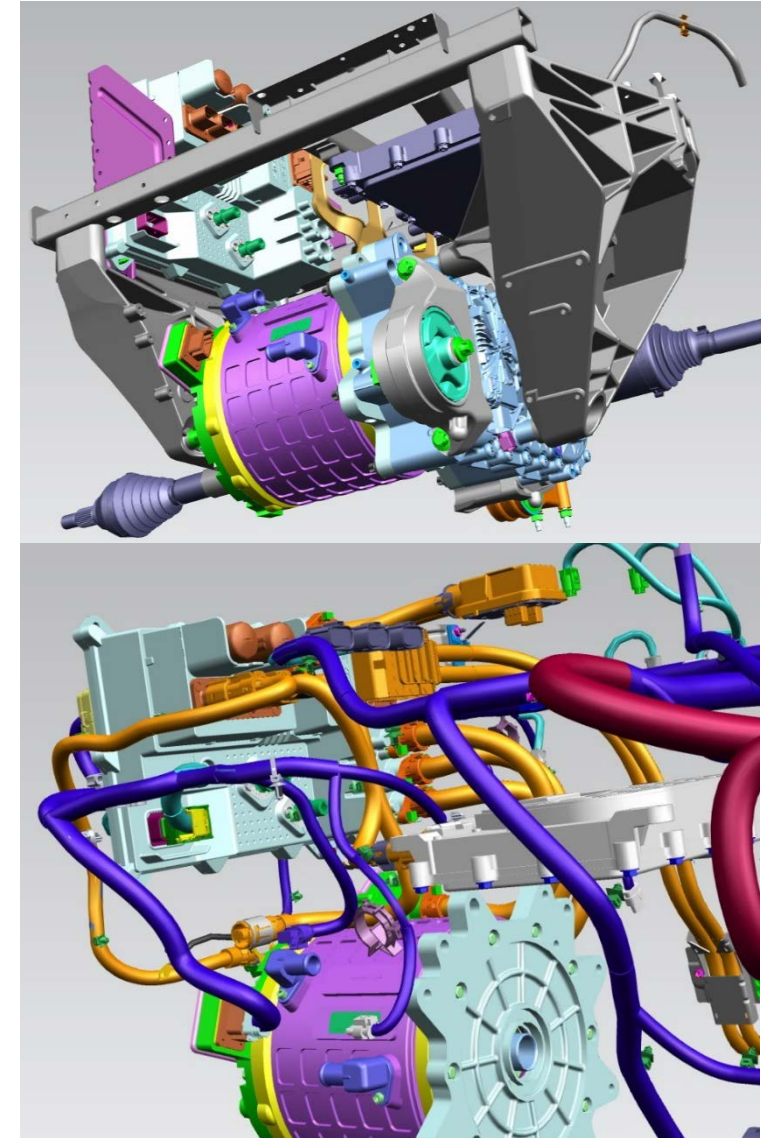


- AC phase connection to the electric machine to invert current during both propulsion and regeneration modes.
- Power demands and available packaging limit the size of the system, so all these systems require cooling to reach the density demands.
- The HVDC-bus connects the inverter to the RESS.
- 12 V DC-bus supplies the inverter with power to operate.
- The Vehicle Motion Control Module is the master of how the inverter system will operate.
- The inverter is mounted to the cradle in the engine compartment and shall withstand NVH energy, thermal, and other environmental stresses.

1. Powertrain

Features & Content

- Propulsion inverter with integrated Power Distribution Unit (PDU). 30 sec peak power of 150 kW and peak output current of 450 Arms.
- Electric permanent magnet machine. 12300 rpm top speed. Peak power of 150 kW and peak torque of 280 Nm.
- Single speed transmission with electric park lock. 8.61 gear ratio. Maximum input, speed: 13000 rpm and torque: 290 Nm.
- DC/DC Converter for power distribution to low voltage units. Peak power of 3.2 kW.
- This is example from a test vehicle



Challenges

- Packaging within existing vehicle.
- Nominal Voltage
- High Voltage
- Low Voltage
- OMS Law
- Battery SOC (State Of Charge) and safe operation window
- Safety function to be prepared for the future of autonomous cars
- Safety standards as ISO 26262 (Automotive Safety Integrity Level).
- IMMO
- CAN bus 11bit/29bit /Intel /Motorola /Siemens/Bosch.....
- EMC Inverter is a big source of EMC disturbance and this has to be in acceptable level from car perspective and legal.
- Chinese and European suppliers

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Thank YOU for Listen

Link to NEVS company <https://www.nevs.com/en/>

About presenter Magnus Johansson https://about.me/magnus_jo