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Tendencies of Electrical Transport in Klaipeda Region

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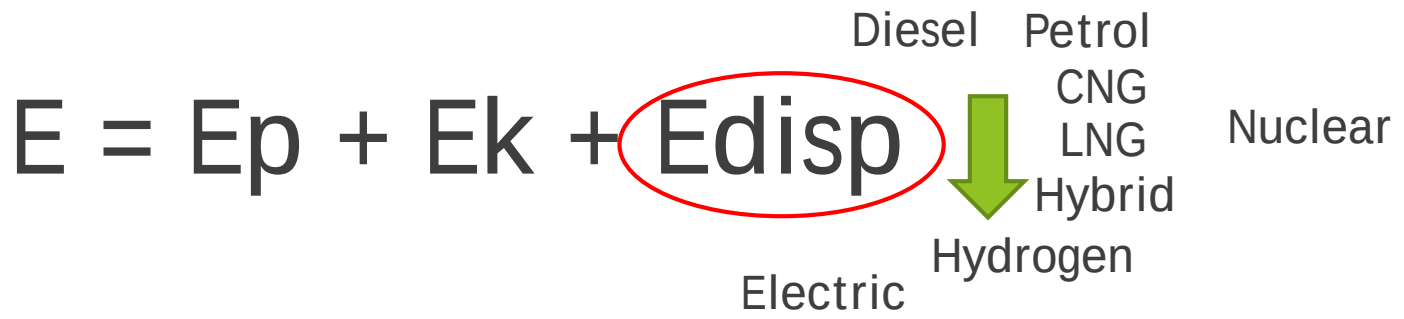
Content

- Means of Transportation
- EU and Klaipeda Policy on Sustainable Mobility
- Electrical transportation Possibilities

Means of Transportation

- The **Energy** needed for transportation of the **same** body weight to the **same** location, with the **same speed** needs the **same** Ep+Ek energy, but losses are **different**



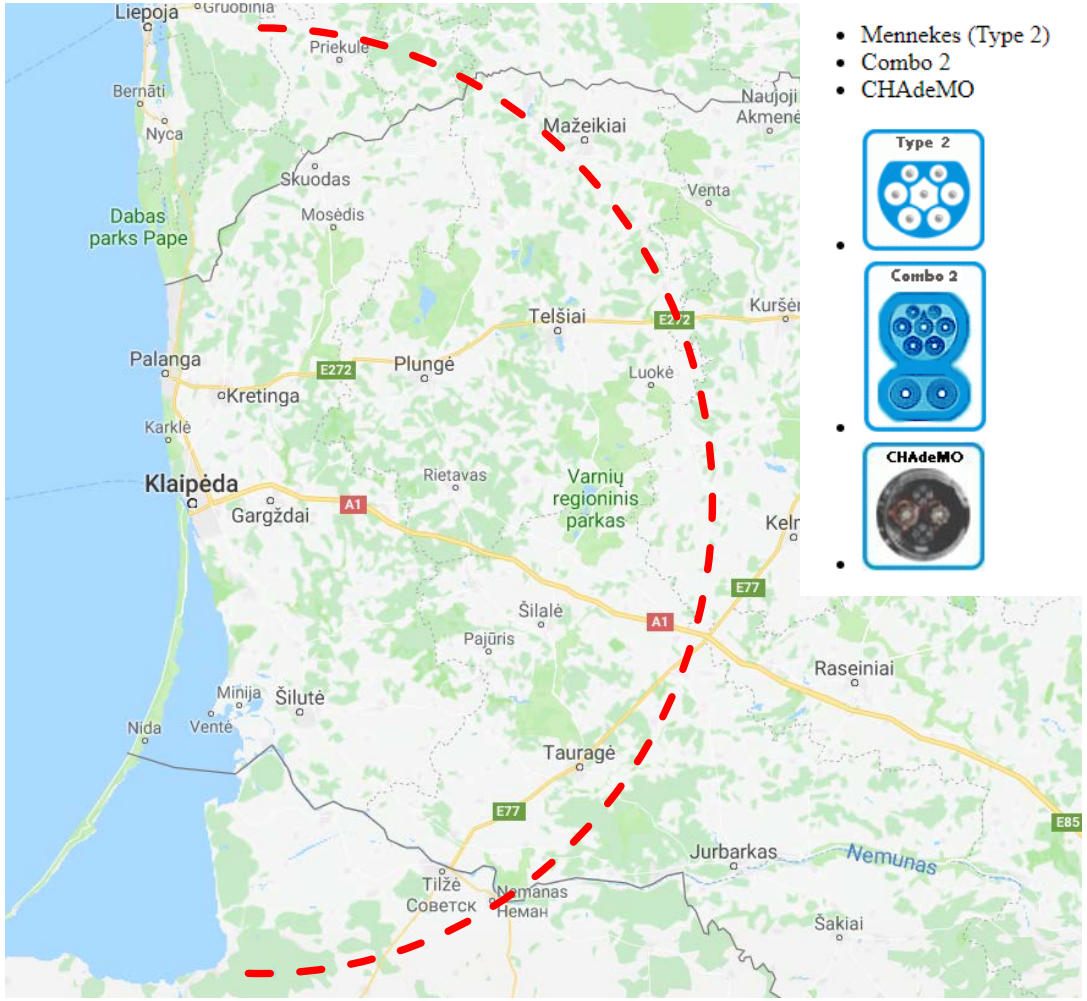
- E – total energy for transportation; Ep – potential energy; Ek – kinetic energy; Edisp – dissipative energy, transferred into heat.

  - This means Efficiency matters and Pollution matters

Directions by EU for Sustainable Mobility

- GREEN BOOK
  - Reduction of Traffic Jams
  - Reduction of Pollution
  - Integration of Smart Technologies
  - Increase of Accessibility
  - Increase of Safety and Security
- WHITE BOOK
  - The main aim is to reduce the pollution from the transport up to 60 percent:
    - Use less energy
    - Use cleaner energy
    - Increase usage of sustainable transport

Western Region of Lithuania and Distance Ranges



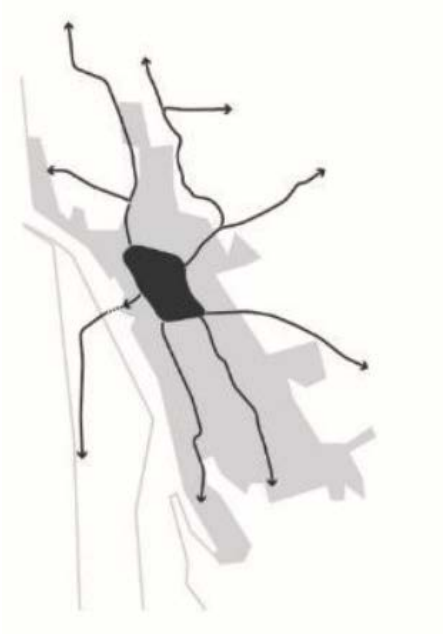
- Mennekes (Type 2)
- Combo 2
- CHAdeMO

- For now the good reachable range with the busses and personal electrical transport is **100 km in Western Lithuania region**
- The charging infrastructure which is developing now is more dedicated to the **private electrical transport**.
- In **A1 Highway** between Klaipeda and Vilnius there are **12 charging stations**, mostly 125 ADC/63A AC current capacity. (Mode 3 – 22 kW and Mode 4 -120 kW)

Klaipeda City Sustainable Mobility Policy

- Klaipeda is on the finalizing stage of preparation of Strategy of Sustainable Transport – three scenarios:

Old Town for pedestrians and better transportation system



Quality of local centers and active mobility

Main axis of city‘s transportation system

Private Electrical Transportation

- Electrical cars
  - Nissan Leaf

  - Tesla S
  - Chevrolet Bolt EV

  - BMWi3
  - Kia Soul EV
  - ….

- Other:
  - Electrical bikes

  - Electric Scooter

  - Electrical Segways

  - Electrical skateboards

  - Electrical ships and boats

Public Electrical Transportation

Normal Electrical Buses		**Metro Electrical Buses**	
Mini Electrical Buses		Trolleybus	
Tram		Metro	
Electrical Truck and Public Special Transport and Ferries	  		

Comparison of Electrical Buses

	DANKER Lithuania	EBUSCO Holland	Linkker Finland	SOLARIS Poland	BYD China	bluebus France
Weight	**6.0 t**	12.5 t	9.5 t	12.4 t	12.3 t	12.5 t
Passengers	**92**	90	74	70	65	90
Battery	**48 kWh**	311 kWh	48 kWh	125 kWh	140 kWh	240 kWh
Battery weight	**1.1 t**	2.2 t	2.0 t	2.5 t	2.5 t	2.5 t
Range	**50 km**	300 km	30-50 km	200 km	250 km	180 km
Charging time	**6 min**	4 h	10 min	4 h	4 h	5 h
Average consumption	**0.45 kWh/km**	0.98 kWh/km	1.05 kWh/km	1.28 kWh/km	1.23 kWh/km	1.25 kWh/km
Price	**€ 450 000**	€ 435 000	€ 670 000	€ 430 000	€ 410 000	€ 550 000

Source: JSC „Vejo projektai“

Possibilities of developing Dancerbus in Klaipeda

- Passenger capacity – up to 100
- Range – up to 50 km
- Speed – 70 km/h
- Ultra fast charging – up to 80 % of SOC in 6 min.
- Fully loaded weight – 12 tons (normal buses – 18 tons)
- Weight efficiency – 50 percent (normally 30 percent)
- Charging – opportunity charging

Source: JSC „Vejo projektai“

Autonomous Electrical Transportation

- New arising technology of autonomous electrical buses public taxi:

Infrastructure for Electrical Transportation

- Problem of charging infrastructure do not increase electrical transportation usage.

- Now in Klaipeda 5 places, but upcoming 12 (with power capacity for one car 22 kW). Nissan leaf has now 60 kW battery, which will charge in about 3 hours with such chargers.

Some Issues Regarding Electrical Transportation technologies

- Wired (Trams, Trolleybus, Metro)
  - Advantages:
    - No batteries – no utilization needed in the future
    - Mature technology
    - Fast and load efficient
  - Disadvantage:
    - Heavy infrastructure, reshapes the city view
    - Expensive to implement
- Plug in Electrical Vehicles (E-buses, e-taxi, personal electrical vehicles)
  - Advantages:
    - Not fixed route
    - Ultra fast charging
    - Less expensive than wired system to implement and maintain
  - Disadvantage:
    - Still expensive to buy
    - Less load efficient
    - Season

As a conclusion

- For sustainable transportation and less pollution in Klaipeda:
  - Use of electrical transport is increasing, but mostly in private actions and not in cars but Segwags, scooters and other, because it is available by **price** and could be **charged anywhere** and it is **fun**.
  - Public transportation in Klaipeda from the point of investment is more towards the public buses with different capacities, but the Tram solution is also possible.
  - Klaipeda should prepare the public charging not for the existing technologies, but for the future, so the power of charging station should increase.
  - Klaipeda could be the first city test and use the autonomous solutions for public transportation – the linear pattern of the city suits that well.

THANK YOU FOR ATTENTION ☺