Savings of material resources and carbon emissions when converting fossil fuel car to electric

The Swedish government has decided that the emissions of greenhouse gases from domestic transport shall reduce by 70 % latest by 2030 compared to 2010. According to calculations made by Naturvårdsverket, currently decided policy is only estimated to reduce the emissions by 33-40 % [1].

A possibility to improve the reduction of emissions is to replace fossil fuel vehicles with electric vehicles. The market share of electric vehicles is continuously increasing, but the rate at which they are introduced does not seem to be enough to achieve the goal. In addition, much material resources have been put into the existing fleet of fossil fuel vehicles which would to a large degree be wasted if they were replaced by newly produced electric cars.

**This aim of the thesis** is therefore to investigate and estimate the impact on material resources and carbon emissions for the three scenarios:

1. An existing fossil fuel car is used with fossil energy source to the end of life.
2. The fossil fuel car is scraped and replaced by a newly produced electric car.
3. The fossil fuel car is converted to an electric car.

The results shall be used to estimate an impact on the Swedish national level. The ambition is to also link the investigation to the framework of planetary boundaries developed by the Stockholm Resilience Centre [2].

**We seek one student or a team of two students**

The thesis work is hosted by Integrated Transport Research Lab (ITRL) at KTH. Depending on timing and results, you may also have the opportunity to write a scientific paper based on your work.

**Your application, including CV and a motivation letter, is welcome to** Martin Lindahl – [martlin@kth.se](mailto:martlin@kth.se)

Applications will be evaluated continuously, so please submit your application as soon as possible.

**About Integrated Transport Research Lab - ITRL**

ITRL is a multidisciplinary and multi-stakeholder arena that brings together experts from various fields in order to contribute to the development of a sustainable transport system. The main research question is *How can new technology contribute to a sustainable transport system?*

More information at: [www.itrl.kth.se](http://www.itrl.kth.se).

**References**

[1] <https://www.naturvardsverket.se/klimatmal> ([archived](https://web.archive.org/web/20200705120229/https:/www.naturvardsverket.se/klimatmal) from original 2020-07-05)

[2] <https://www.stockholmresilience.org/research/planetary-boundaries.html> ([archived](https://web.archive.org/web/20200705120605/https:/www.stockholmresilience.org/research/planetary-boundaries.html) from original  
2020-07-05)