



**Open your mind. LUT.**

Lappeenranta **University of Technology**

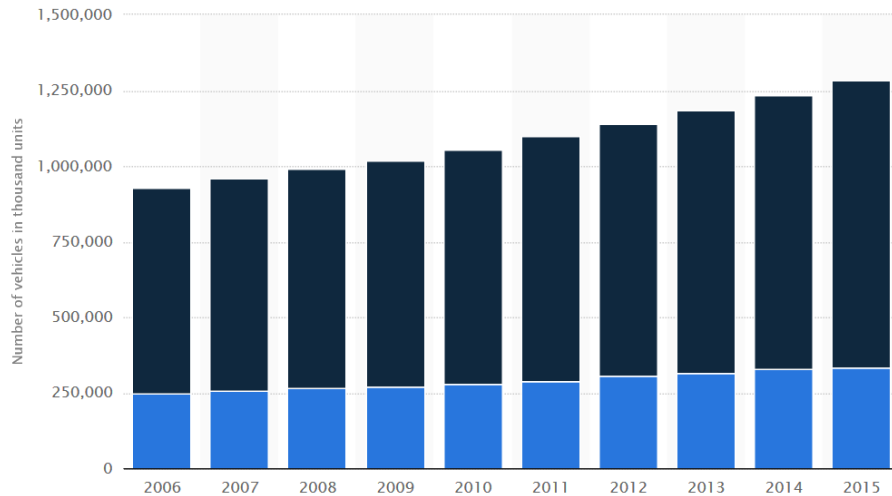
# LIIKENNEHAASTE72

## Sustainability challenges related to traffic systems

Ville Uusitalo  
Assistant professor

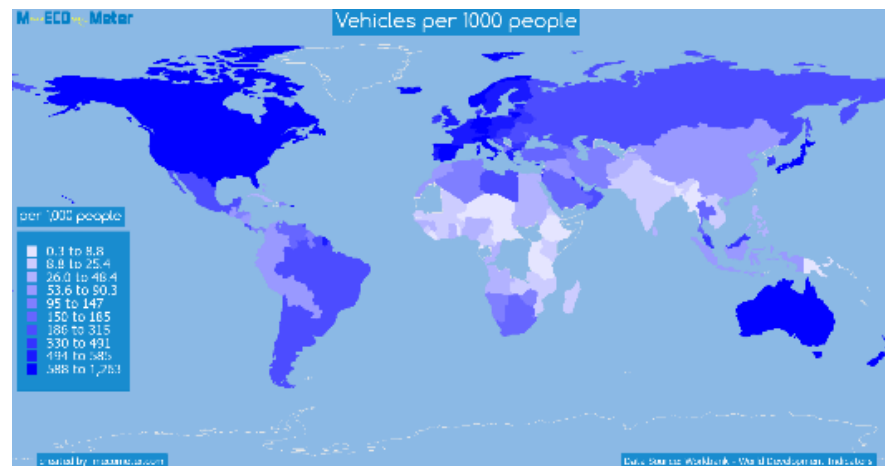
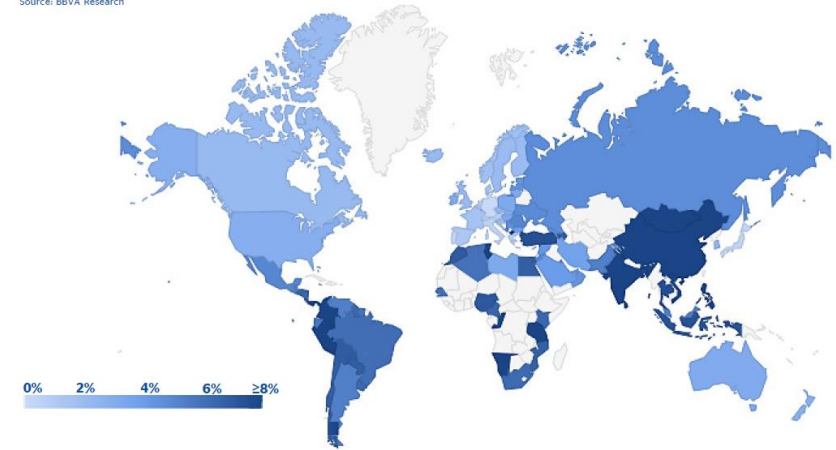


# AMOUNT OF VEHICLES IS GROWING

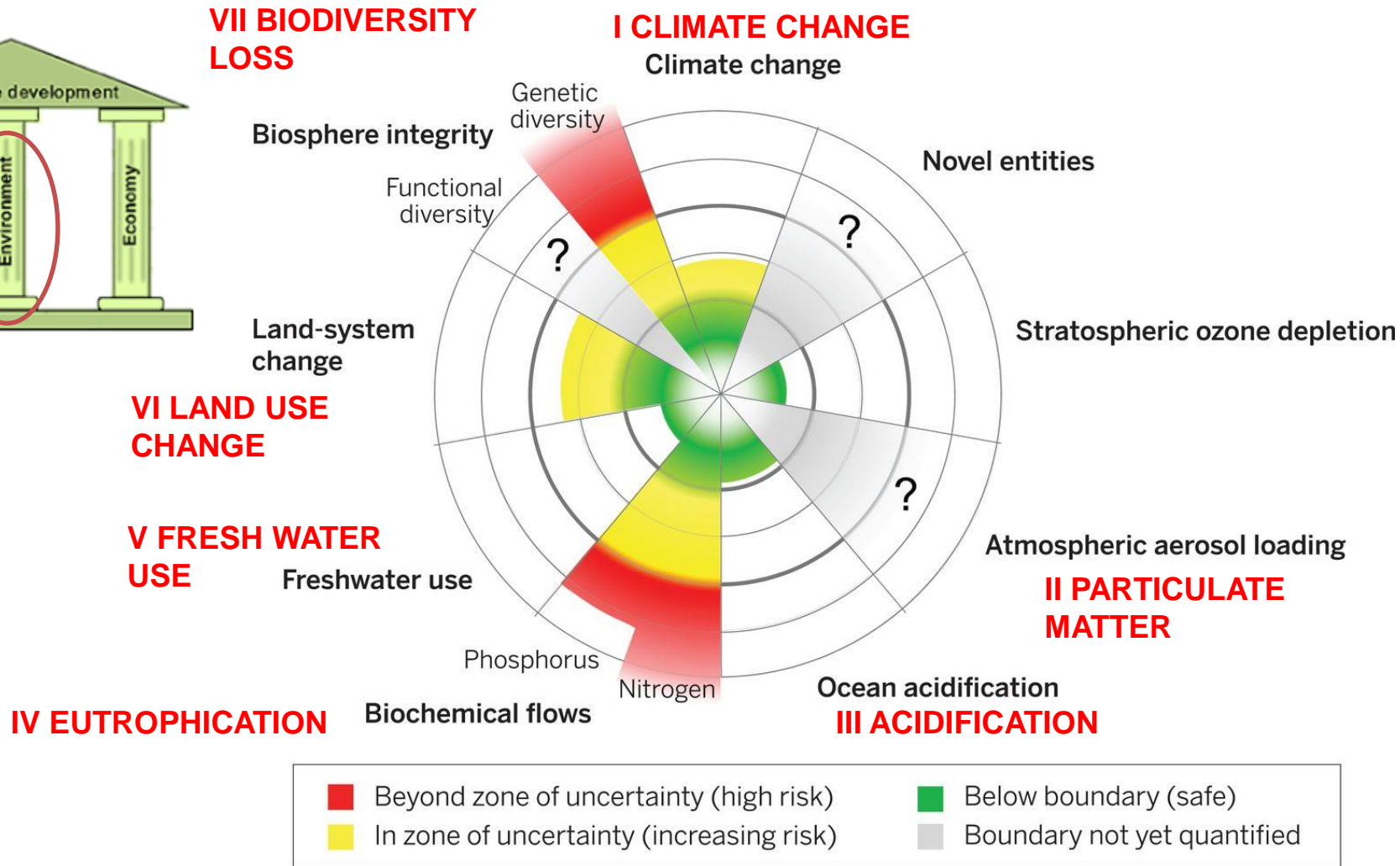
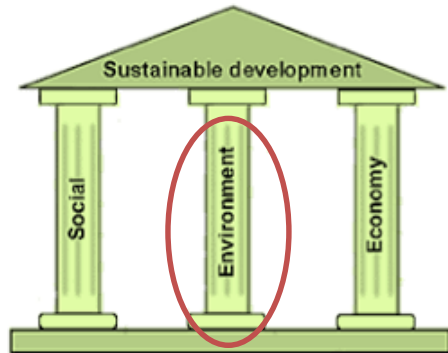


Commercial vehicles Passenger cars

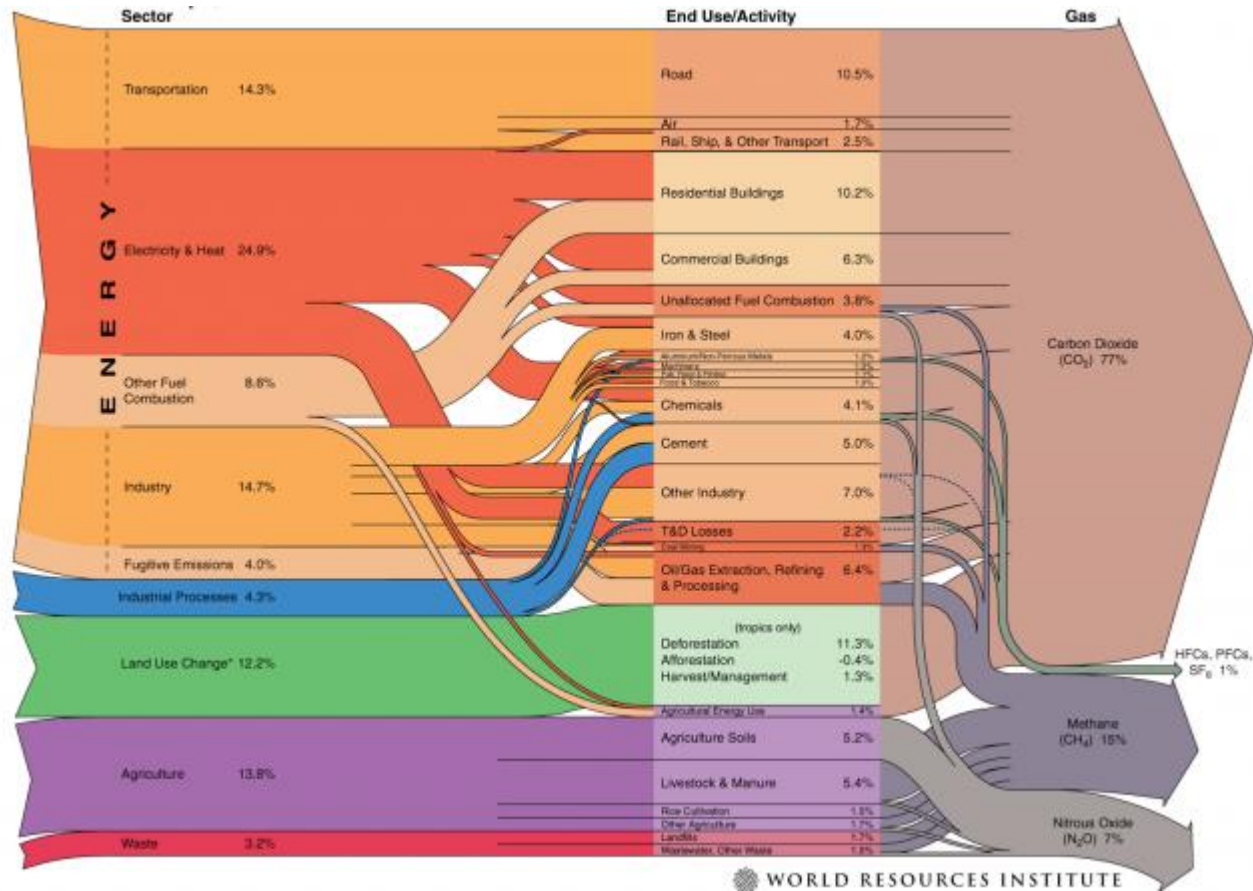
Expected annual increase in World Car Fleet (2010-2020)  
(% yearly growth)  
Source: BBVA Research



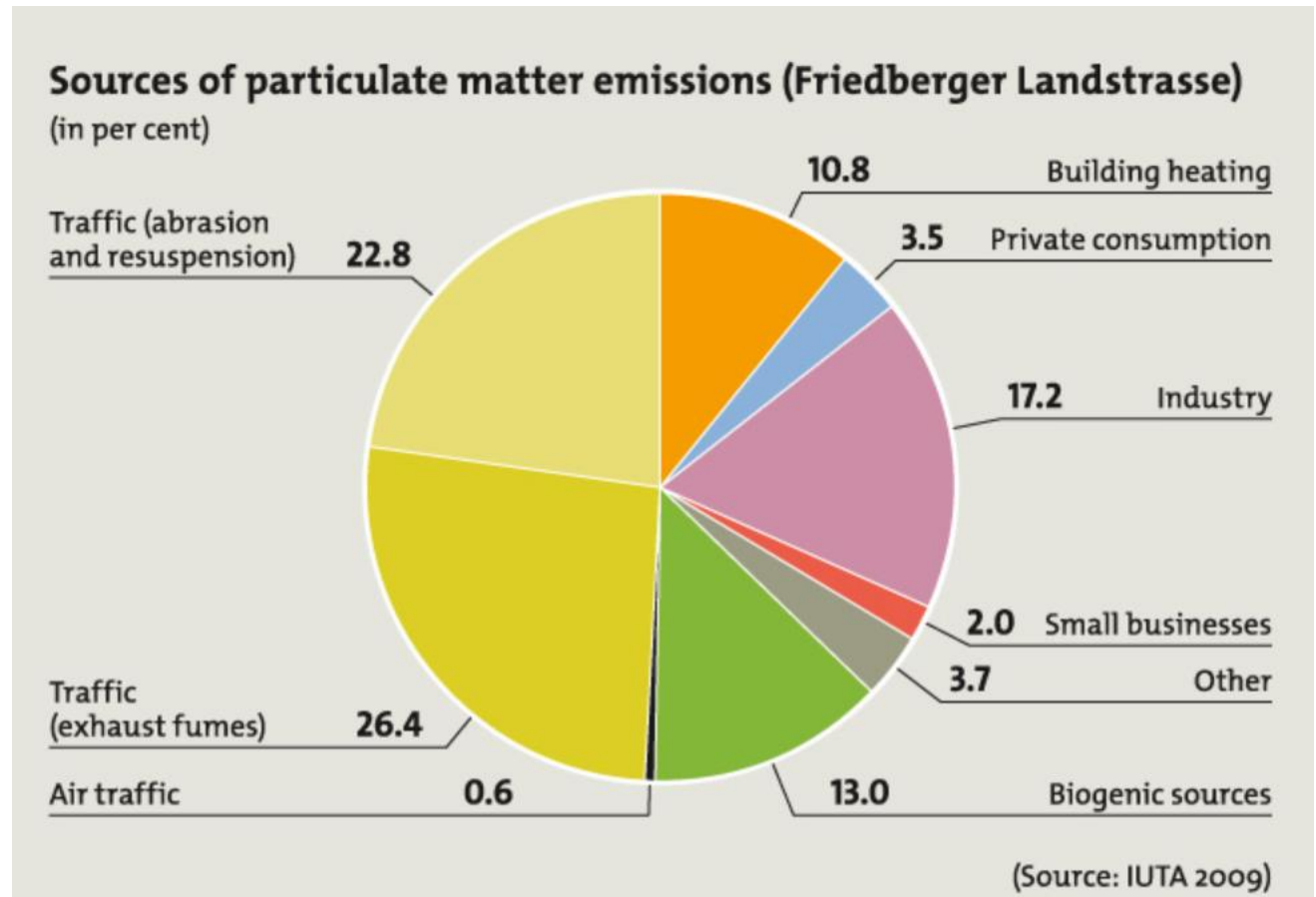
# SUSTAINABILITY CHALLENGES RELATED TO TRAFFIC



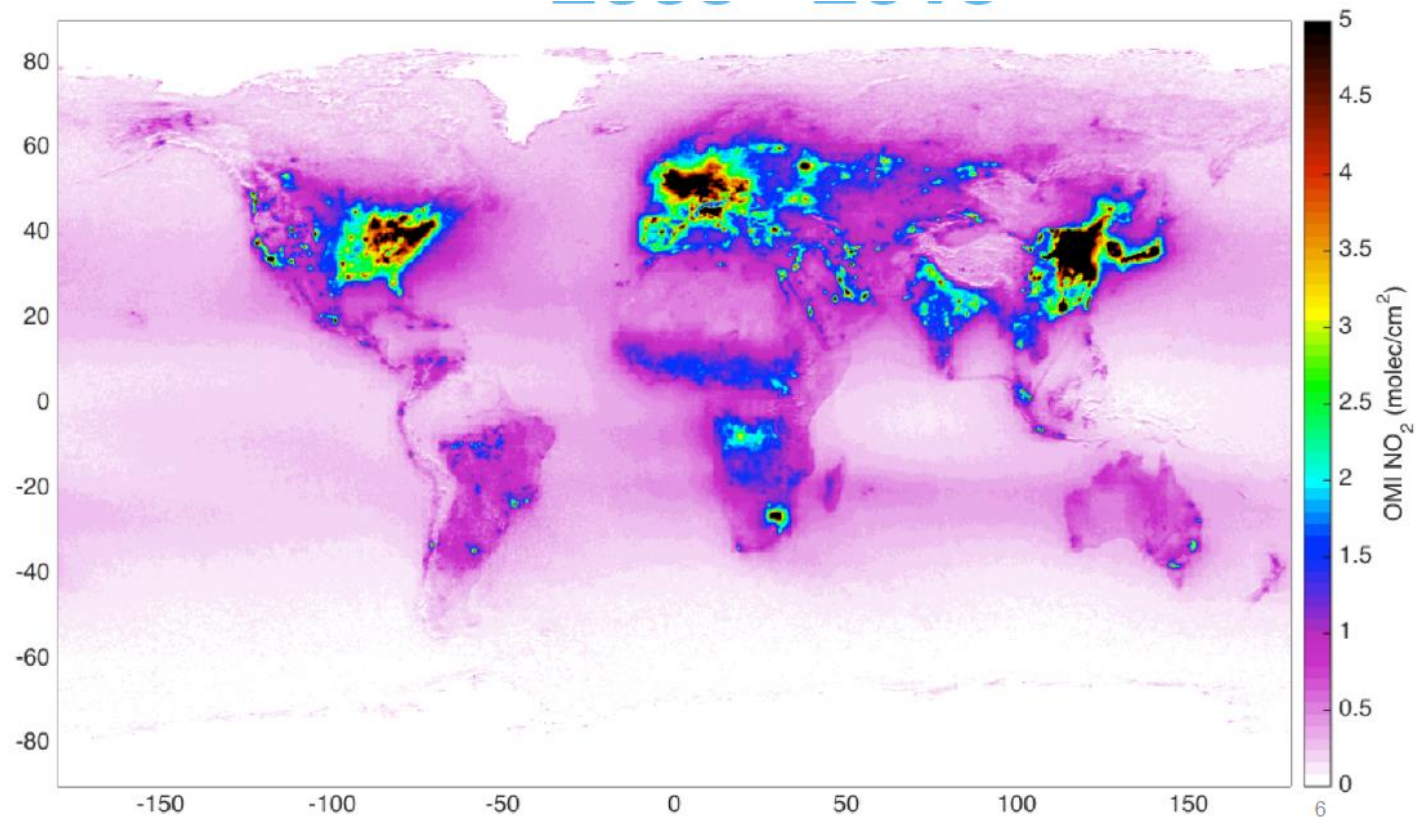
# I CLIMATE CHANGE



# II PARTICULATE MATTER EMISSIONS (AND MICRO PLASTICS)



# III ACIDIFICATION



(Tamminen et al. 2017)

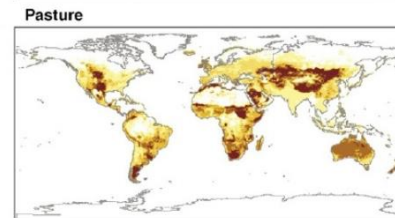
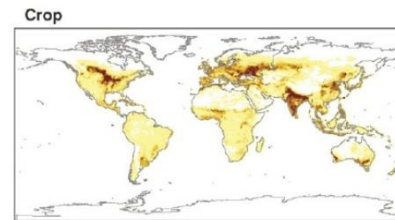
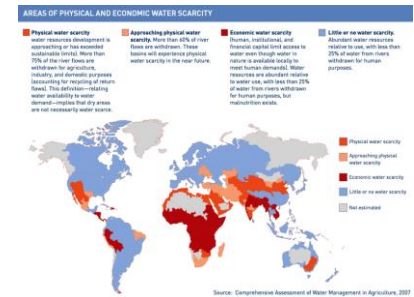
# SUSTAINABILITY CHALLENGES RELATED TO BIOFUELS

IV EUTROPHICATION  
- Fertilizers

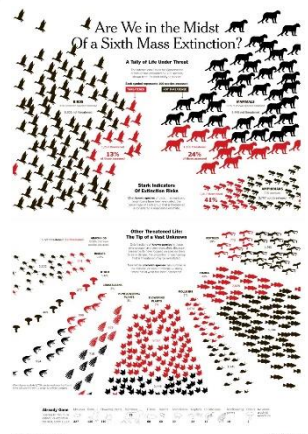
V FRESH WATER USE  
- Irrigation



BIOPOLTTOAINEIDEN  
RAAKA-AINEIDEN  
TUOTANTO



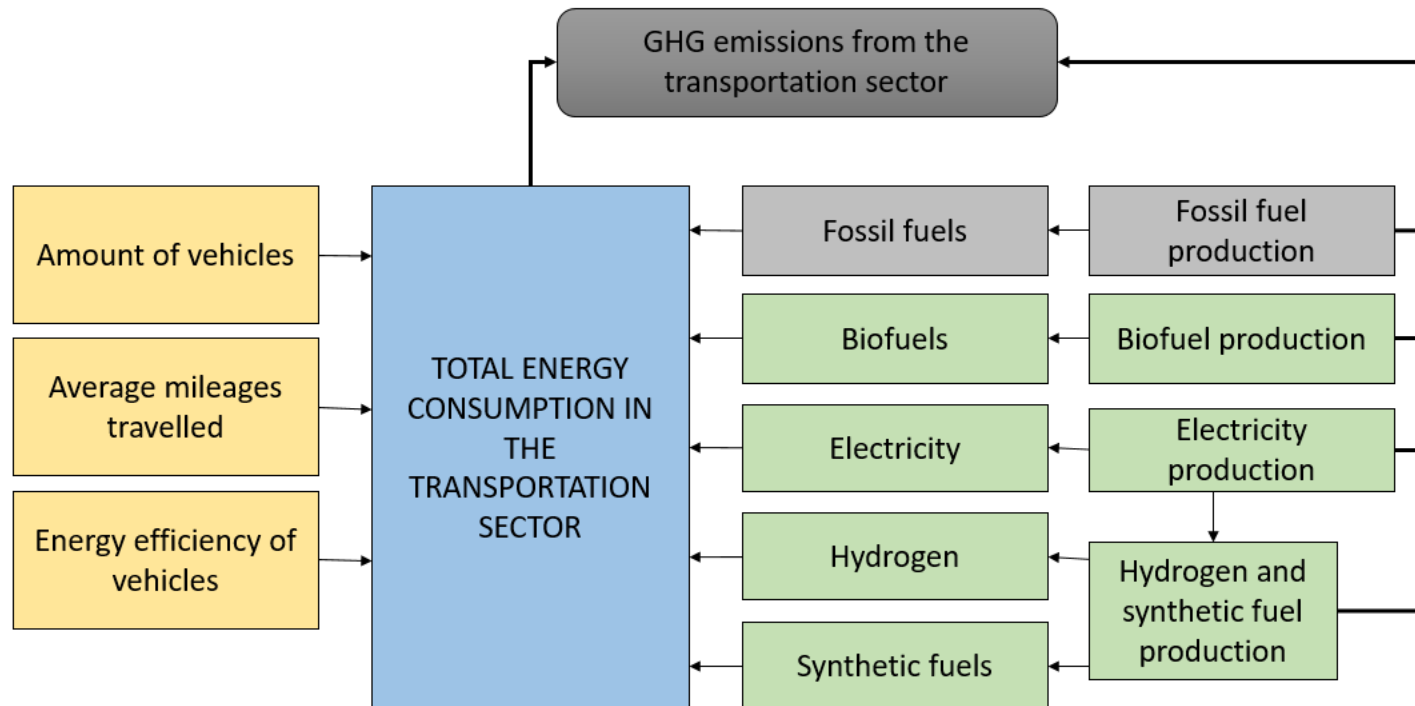
VII BIODIVERSITY LOSS  
- Changes in habitats



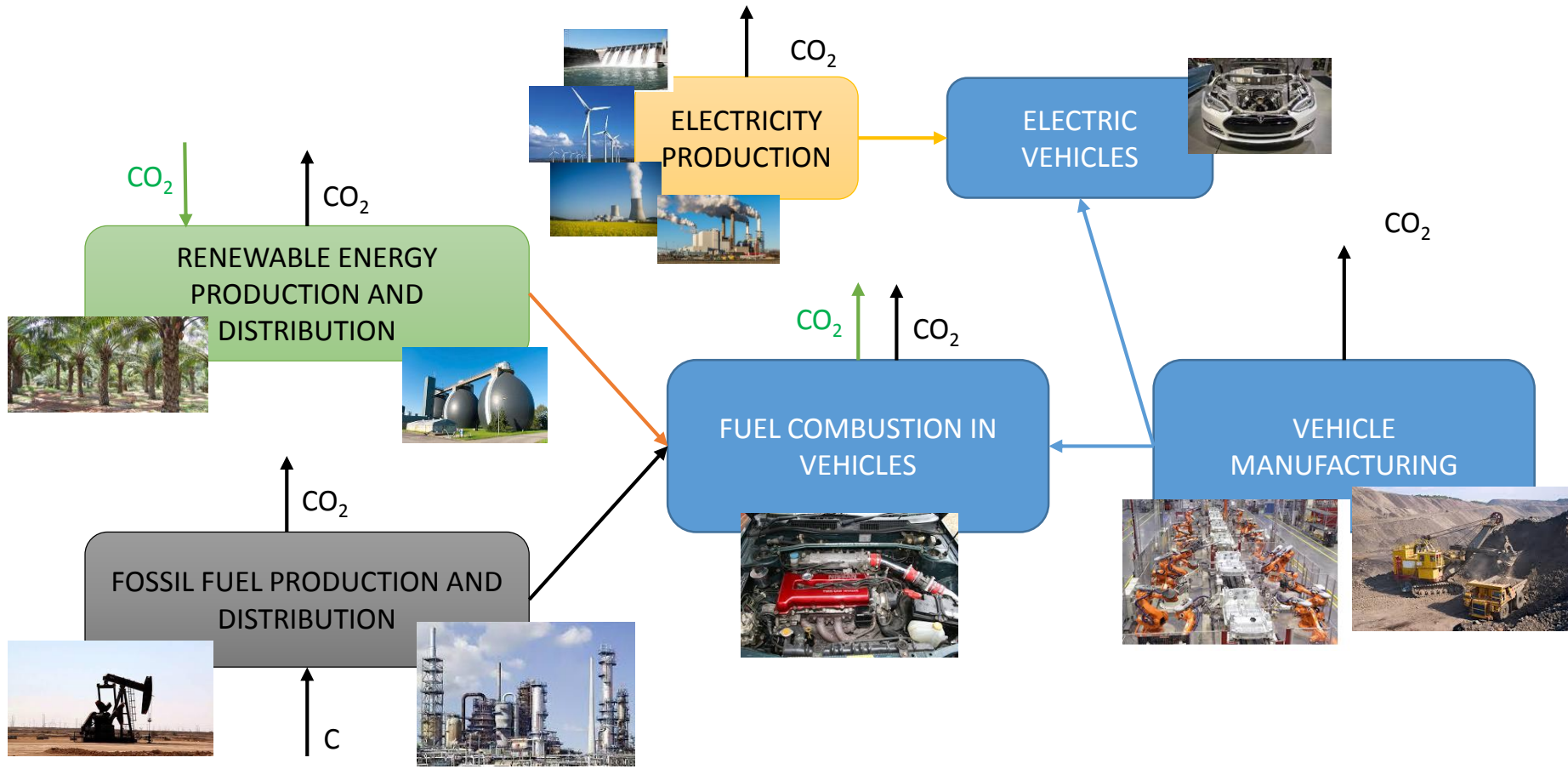
VI LAND USE CHANGE  
- Land use for traffic



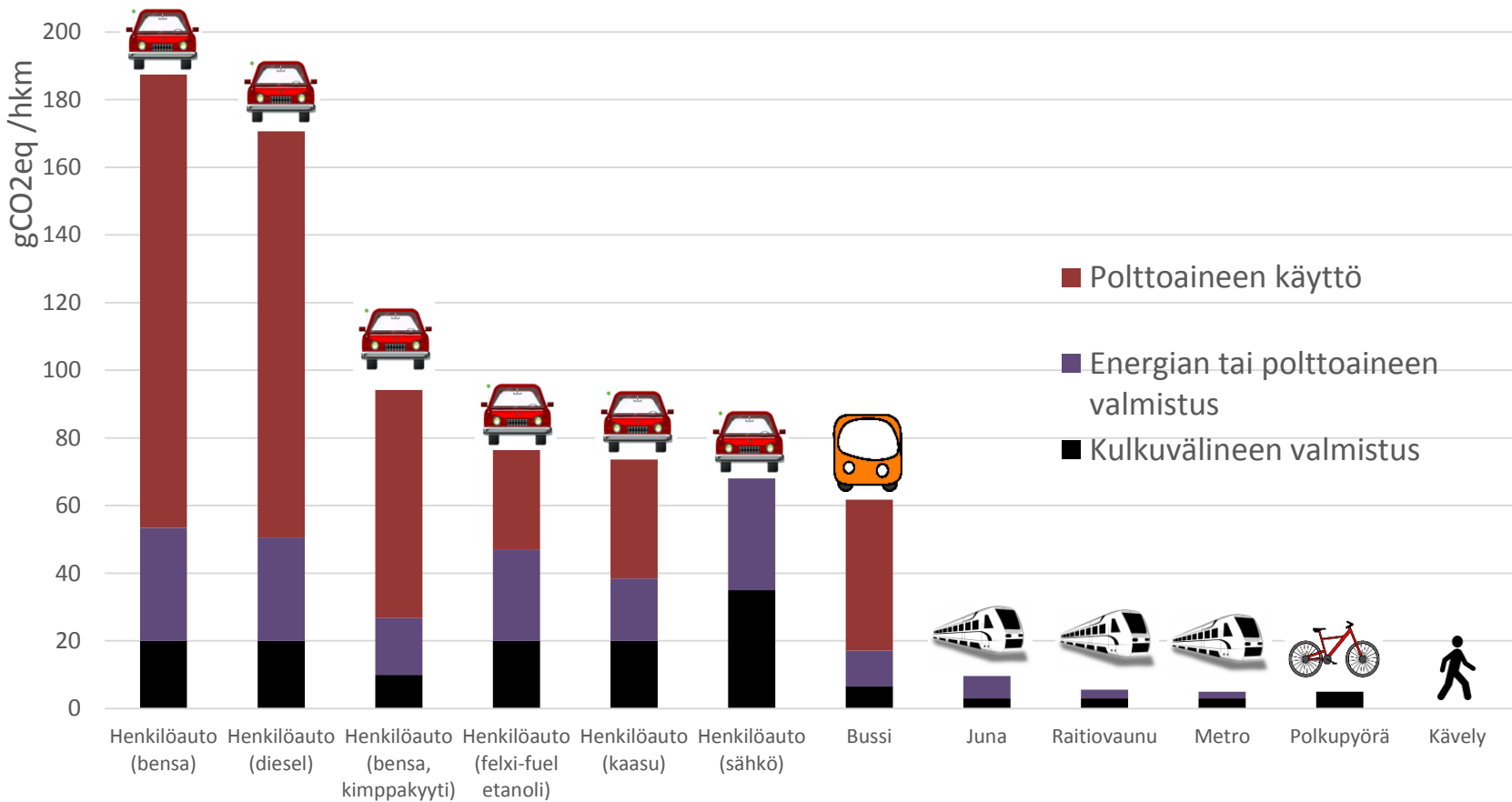
# ENVIRONMENTAL IMPACTS FROM THE TRAFFIC SECTOR



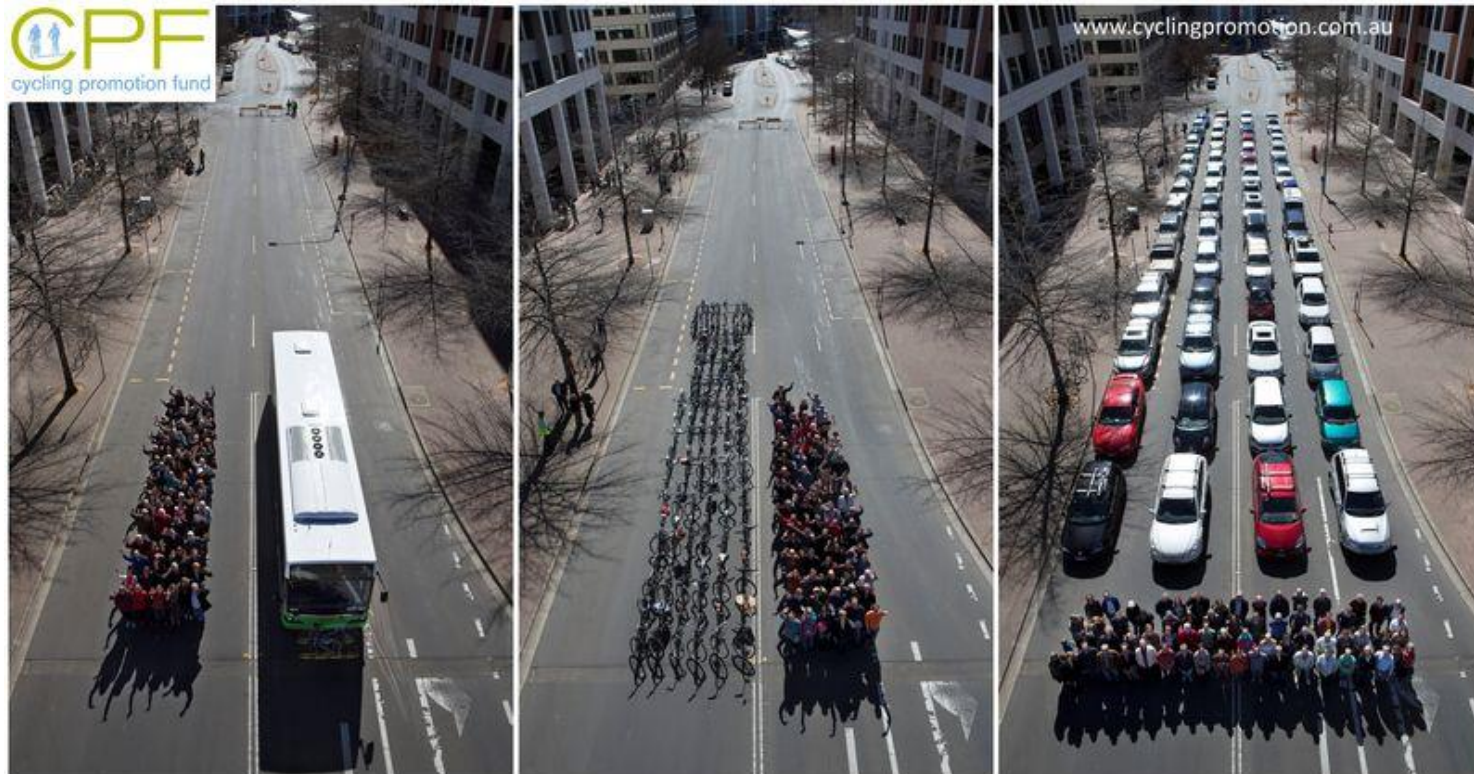
# BASIC IDEA FOR LIFE CYCLE EMISSIONS



# GHG EMISSIONS FROM 1 PKM TRAVEL BY DIFFERENT METHODS IN LAHTI 2018



# SPACE NEED IS A SIGNIFICANT ISSUE ESPECIALLY ON LARGE CITIES



Approximately 30-60% of urban land use is reserved for traffic