

Urban planning as a key to achieving the two-degree-target

MCC study: Climate-friendly urban infrastructures are crucial for climate protection

BERLIN, DATE. In the course of global urbanization, the design of today's transportation systems, buildings and other infrastructures will largely determine tomorrow's CO₂ emissions. Indeed, "going green" now in terms of infrastructure and buildings could cut future emissions in half or about 10 Gt CO₂ per year from 2040 onwards —the same quantity that is currently being emitted by the United States, Europe and India together. These are core findings of a new study that Felix Creutzig from the Mercator Research Institute on Global Commons and Climate Change (MCC) together with colleagues publishes today in the journal *Nature Climate Change*.

To embark on this "green" path, cities around the world would need to incentivize the construction of higher-density, energy-efficient housing and implement new mobility concepts such as car sharing, electric cars and bicycles, and bike paths. The challenge would also call on urban planners to provide citizens with shorter commutes, set up inner-city tolls and realize architectural and technological upgrades of buildings, especially in Asia, Africa and the Middle East. Last but not least, it would require higher gasoline taxes.

"Urban planning and transport could become a major roadblock to reaching the two-degree-target. Once infrastructures are in place, they determine carbon emissions for nearly an entire century—much longer even than coal-fired power stations," says lead author Felix Creutzig. "However, if the world made a dedicated effort to seize the existing opportunities within the next 15 years to upgrade its cities' infrastructures, urban planning will become a key arena for achieving ambitious climate change. Especially in times of right-wing populist and anti-climate regimes, pragmatic urban decision-makers can take more responsibility for climate protection."

The new study is particularly relevant for municipal decision-makers in both large and small cities. To date, most climate protection plans consider the transport and building sectors as being separate entities and only addressed at the national or federal level. The article in *Nature Climate Change*, however, takes a closer look at the municipal level and assesses a city's climate protection potential on the basis of three parameters. These are the emissions savings following upgrades to existing infrastructure; emissions savings from using energy-efficient new infrastructures; yet also the additional emissions generated by the construction of this new infrastructure.

According to the new study, which is based on the aggregation of existing data, the highest emissions reduction potential is offered by the use of new energy-efficient infrastructures. For example, the annual reductions that may be achieved by the year 2040 when using new infrastructures is three to four times higher than that of using upgraded existing urban infrastructures. Nonetheless, even in cities such as New York or Madison, WI, considerable progress can be achieved through the energy-efficient refurbishment of existing buildings, the construction of new, higher buildings and the enhancement of these cities' bicycle paths. Moreover, the very act of building these new infrastructures will invariably involve introducing new CO₂ emissions into the atmosphere. In that regard carbon capture and storage as part of the cement manufacturing process is of great importance.

“If the world’s countries want to limit global warming to below two degrees above pre-industrial levels, they should demand more responsibility of their municipal politicians and urban planners,” says Creutzig. “In order for emerging technologies such as electric cars and bicycles to unfold their full potential in climate protection, policies must ensure that these technologies are actually replacing rather than just supplementing the older, dirty technologies.”