

Napoli, Valencia, Athens, Göteborg, Poznan, Karlsruhe, June 20th 2021

Ms Ursula von der Leyen, President of the European Commission
Mr Frans Timmermans, Executive Vice-President and Commissioner of the
European Commission – Climate Action
Ms Kadri Simson, Commissioner of the European Commission - Energy
Mr Thierry Breton, Commissioner of the European Commission – Internal Market
Ms Adina Valean, Commissioner of the European Commission – Transport
Mr Mauro Petriccione, Director General of the European Commission – Climate
Action
Ms Ditte Juul-Jørgensen, Director General of the European Commission – Energy
Ms Kerstin Jorna, Director General of the European Commission – Internal Market
Mr Henrik Hololei, Director General of the European Commission – Mobility and
Transport

***Subject: Open letter to the European Commission about severe concerns
regarding calculus of CO₂ emissions and consequent measures***

Dear President von der Leyen,
dear Executive Vice-President Timmermans,
dear Commissioner Simson,
dear Commissioner Breton,
dear Commissioner Valean,
dear Director General Petriccione,
dear Director General Juul-Jørgensen,
dear Director General Jorna,
dear Director General Hololei,
dear Sir or Madam,

the IASTEC signees of this letter are representatives of technical universities with research focus in the field of energy, vehicle and drivetrain technology in Europe. We appreciate the EU ambitions to reduce CO₂ emissions and we thank you for your efforts to establish a legislation framework. The recommendations of IPCC¹ encourage us to quickly reduce the CO₂ emissions of all sectors including electricity and traffic. Especially the sector traffic must and will be completely sustainable and BEV, FCV as well as Hybrid technologies have to support this goal.

However the signees kindly inform you about concerns, which we want to share with the most important policymakers of the EU to improve our energy system in an optimal way. After studying many position papers, drafts and even reviewed scientific publications and analyzing political declarations there are deep concerns of the signees, that the fundamental derivation of CO₂ emissions of the sector electricity is based on an insufficient calculus. Please note that the CO₂ impact ΔF_{CO_2} (unit: g_{CO2}/h) of an additional electrical consumer ΔD is typically simplified in representative publications as $M \cdot \Delta D$ (eq.1)². We

¹ IPCC: Intergovernmental panel of climate change

² M: average CO₂ footprint, i.e. Germany expectation for 2030: 244 g_{CO2}/kWh

ΔD : additional electrical consumer, i.e. 1 kW. Eq.1: typical calculation reveals 244 g_{CO2}/h

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kindly want to inform you, that the correct calculus is $\Delta F_{CO_2} = M \cdot \Delta D + \Delta M \cdot D$ (eq.2)³, according to the fundamental theorem of Leibniz from the 17th century. The additional contribution of the second summand $\Delta M \cdot D$ depends on the status of the electricity system and is typically omitted very often. Please kindly note that the real CO₂ emissions (eq.2) can exceed those of eq. 1 easily by more than factor 2, depending on the year and the status of the energy system!

As a consequence we must inform you, that due to the typically unnoticed miscalculation the CO₂ saving potential of additional contributors of the sector electricity is much more limited than expected by many politicians and communicated! This situation clearly is in contrast to the recommendations of quick CO₂ reduction of IPCC.

Indeed BEV⁴ technology is attractive depending on the use case respectively the detailed customer demands. However the most promising chance to significantly reduce CO₂ emissions of the combined sector energy and traffic is an intensive ramp up of CO₂-neutral reFuels (bioFuels plus eFuels) blending rate. Our recommendation for G40 and R33⁵ in the year 2030 with a CO₂ reduction potential of at least 25% is challenging and needs a clear political support. A complete phasing out of fossil fuel in the decade of the 2040s is realistic. Please note that G40 and R33 are completely compatible to the existing fuel specifications and all citizens of the EU could contribute to our CO₂ emissions reduction goal, even with 20 year old vehicles.

Please allow to express our irritation that misleading information about reFuels are typically shared in many publications. Comparing a BEV and a most modern hybrid vehicle and assuming a given regenerative electric energy⁶ in Europe indeed the longest range of driving can be realized by directly charging a BEV. As an alternative the electric energy can be transferred into a reFuel. The average driving range of a BEV is 2-3 times longer compared to a reFuels hybrid vehicle, although the factors 5, 7 and even 10 are sometimes presented. Please note that the complete system must be analyzed⁷. On the other hand side the output of photovoltaics and windpower is 2-3 times higher in many regions of the world compared to Europe. Energy storage issues are solved in parallel following the reFuels path.

Consequently we kindly comment, that the drivetrain with lowest possible CO₂ impact of a compact car, especially a hybrid diesel seems to be completely banned politically and economically although the CO₂ reduction potential of a combined Diesel Hybrid with R33 fuel amounts to roughly 50% in the year 2030, which is completely impossible for many countries with a BEV strategy, as eq.2 must be considered! Therefore we very kindly

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³ ΔM : change of CO₂ footprint due to an additional electrical consumer ΔD of 1kW, i.e. Germany expectation for 2030 and $D = 57,6$ GW: $5,52$ gCO₂/(h·GW)
 D : total amount of electrical consumer in GW. i.e. Germany expectation 2030: $57,6$ GW:
 $\Delta M \cdot D = 5,52$ gCO₂/(h·GW) · $57,6$ GW = 318 gCO₂/h
 Total equation 2: $\Delta F_{CO_2} = 244$ gCO₂/h + 318 gCO₂/h = 562 gCO₂/h; equation 1: 244 gCO₂/h
 detailed information: www.IASTEC.org/publications

⁴ BEV: battery electric vehicle

⁵ G40, R33: Gasoline and Diesel blended fuel with reduced fossil content, see also detailed information: www.IASTEC.org/position-paper

⁶ "regenerative energy" is not correct from the thermodynamic perspective, but a well known expression

⁷ detailed information: www.IASTEC.org/position-paper

request you to recalibrate the scheduled legislation in the name of all EU citizens who expect an effective CO₂ reduction.

Please also consider the enormous technology leadership potential for Europe's industry in the field of reFuels production, trade and utilization.

We kindly express our vision that reFuels enable poor countries of the 3rd world to prosper by establishing reFuel based energy business with Europe.

Our concerns have increased that the centuries old dream of mankind of individual mobility for all populations in Europe will be significantly limited by the current BEV oriented strategy! We need all technical solutions including an improved BEV strategy. But the only chance to enable automobile-based mobility for all regions in Europe in combination with intensive CO₂ reduction is the intensive increase of reFuels production.

Finally we kindly want to inform you, that important IASTEC partner regions of the world as China, Korea, Japan and USA also recommend an intensive reFuels strategy. We kindly request you to consider this assessment, as the internal combustion engine based hybrid drivetrain technology is expected to remain an important technology for decades together with fuel cell and battery vehicles. Indeed we have nearly lost Europe's technical leadership in the field of drivetrain technology due to partly irritating technology discussions. Please find additional information in our positioning paper which is signed by 170 experts from Europe and all over the world⁸.

We grateful express our thanks for considering our information and offer our willingness to exchange our knowledge.

Yours sincerely



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⁸ detailed information: www.IASTEC.org/position_paper