

## Human Rights and the Use of the Technologies of the Fourth Industrial Revolution for Electrified Vehicles, Self-Driving Cars and Driverless Public Transport

### I. Introduction

1. The shift from fossil-fuelled to electrified vehicles: a profound civilisational and economic change
  - apart from the electric and electronic systems, *cars will become technically simpler* and, in the long run, cheaper and easier to maintain - with considerable economic consequences
  - *new infrastructures need to be built* for a sufficient and practicable energy supply of the electrified vehicles
  - the advanced digital technologies of the Fourth Industrial Revolution (esp. interconnection, artificial intelligence) allow the *comprehensive coordination of self-driving electrified vehicles* (the second generation) in highly integrated, smart traffic flow management systems that optimise individual traffic and increase road capacity, and also *driverless public transport*
2. A change rather serving than threatening human rights
  - a suitable way to reduce air pollution, combat climate change and protect the citizens' health; the use of the Fourth Industrial Revolution technologies supports this approach by optimising individual and public transport
  - the protection against environmental health impairments is a classical fundamental obligation of the state
    - see for Indonesia art. 28H(1) Constit. 1945
    - see the judgement of the CENTRAL JAKARTA DISTRICT COURT of 16.09.2021,<sup>2</sup> which orders stronger measures against air pollution (but denies human rights violation)
  - the *change today may be necessary to avoid more severe restrictions in the future*
    - see the landmark decision of the German FEDERAL CONSTITUTIONAL COURT of 24.03.2021<sup>3</sup> about *fundamental rights as "intertemporal guarantees of freedom"* that do not allow to offload the inevitable burdens of greenhouse gas reduction for climate protection unilaterally onto future generations

### II. Relevant aspects of human and fundamental rights doctrine

1. Two complementary sets of legal standards: human and fundamental rights
  - on terminology: • "human rights" are the pre-legal ("natural") rights of the human being (according to philosophical doctrine) and the rights guaranteed in international human rights treaties (who pretend just to reflect them); • "fundamental rights" are the legal positions created by the implementation of this doctrine into the national constitutional law
  - standards of both categories apply parallelly, complementing each other; authorities must comply with all of them
2. The rights primarily concerned
  - a) Property, right to physical integrity and right to life
    - classical rights, anchored heterogeneously, sometimes incompletely, in the human rights treaties and constitutions
    - will be affected in case of *accidents caused by technical failures* in the use of the new technologies
  - b) Right to privacy and connected rights
    - guaranteed in art. 17 ICCPR and numerous constitutions, in Europe also in art. 8 ECHR and 7 EUChFR; see also art. 12 UDHR, 21 ASEAN Human Rights Declaration
    - highly developed and differentiated in Germany: distinct rights • to privacy, • in one's own picture, • in one's own spoken word, • of informational self-determination (data protection) and • to ensured confidentiality and integrity of IT systems, combined in a general right of personality
    - will be affected in daily life by the *large-scale collecting, storing, sharing and exploiting of personal data* by the new digital technologies, which is necessary to coordinate the electrified vehicles in the advanced systems of individual and public transport of the new era
3. The two dimensions of the commitment to human and fundamental rights
  - a) The state's obligation to respect human and fundamental rights
    - in particular: to design and manage own advanced technical systems in a way that technical failures and manipulations from outside are excluded
  - b) The state's "positive obligations" / "duties of protection"
    - here: to ensure by regulation and other measures that the private use of electrified vehicles, including self-driving cars and driverless transport systems, is safe and refrains from unjustified encroachments on privacy
    - theoretical background: the doctrines of "positive obligations" of the EUROPEAN COURT OF HUMAN RIGHTS<sup>4</sup> and "duties of protection" of the GERMAN FEDERAL CONSTITUTIONAL COURT<sup>5</sup> and the confirmation of "positive obligations" under the ICCPR by the HUMAN RIGHTS COMMITTEE<sup>6</sup>
    - the lower, still unclear standards of these obligations
    - the challenge to distinguish negative and positive obligations in case of highly integrated systems combining various public and private players

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<sup>2</sup> Central Jakarta District Court, 16.09.2021, 374/Pdt.G/LH/2019/PN.Jkt.Ps.

<sup>3</sup> Federal Constitutional Court, 24.03.2021, 1 BvR 2656/18 a.o. (with [English translation](#)).

<sup>4</sup> Cf. ECtHR, 23.07.1968, Belgian linguistics; 13.06.1979, Marckx v. Belgium; 28.10.1998, Osman v. UK; 20.12.2011, Finogenov a.o. v. Russia.

<sup>5</sup> Federal Constitutional Court, BVerfGE 88, 203; 115, 118; 121, 317.

<sup>6</sup> HRC, General Comment No. 31, no. 8.

### III. Shift to electrified vehicles not a problem as such

- vehicles with electric drive bring advantages but also new risks:
  - high-voltage system can cause accidents and even death in the event of short circuits, electric arcs or contact with humans
  - traction batteries are at risk of fire if deformed in an accident (→ thermal runaway)
  - lithium-ion accumulators bear risk of release of highly flammable liquids and gases
- negative obligation: state must not operate itself any electrified vehicles or systems which are not absolutely safe
- positive obligation: state must protect citizen effectively against dangers posed by electrified vehicles by
  - cautious practice of vehicle type approvals
  - appropriate regulation (of vehicles and charging stations) and enforcement
  - information campaigns
  - mandatory professional development for car mechanics and mechatronics
  - special training of firefighters and other security forces in dealing with burning and crashed electric cars
- Yet, no difference from other introductions of new, potentially hazardous technologies - state must simply do its job!

### IV. Problems arising from the use of the new advanced digital technologies in or in connection with electrified vehicles

1. The extensive use of the new technologies
  - a broad use of a wide range of sensors, supercomputers and other high-tech IT equipment, both stationary and mobile
  - an all-embracing interconnection of electrified vehicles, public and private infrastructures, and users
  - a massive fully automatised and intransparent acquisition, flow, merge, accumulation, procession and advanced use of personal and non-personal data by a multitude of public and private players
  - a growing use of artificial intelligence for a comprehensive smart traffic flow management regulating the speed, distance, acceleration and deceleration, use of lanes and later possibly the routing of individual vehicles, and in the field of public transport for the operation of fully autonomous (driverless) transport systems (e.g. subways)
2. The risks
  - the risk of *accidents* caused by malfunctions of the smart integrated systems due to faulty design, poor interaction of their various players, unforeseen problems not taken into account or other technical failures
  - the risk of *criminals and terrorists hacking into the integrated systems*, causing spectacular accidents and gridlocks or manipulating the traffic flow in their interest
  - the high risk of *abuse of the immense stock of personal data* by public authorities or private persons, e.g. for personal surveillance (supported by automatic face recognition), profiling and economic exploitation
  - the risk of *blurred responsibilities* in the intransparent complex integrated systems
    - Who will pay for the damage in case of an accident between self-driving electrified cars if the traffic control system was irritated by exceptional weather conditions, the cars were reasonably maintained but the sensors dirty and the brakes a little bit worn out, the software certified but with some bugs, the car's operation system not recently updated and the local 5G too slow at that day to transport enough information in time?
3. Some general solution approaches
  - a) Prevention of risks by proactive regulation, demanding safety standards and administrative control
    - for electrified vehicles, infrastructures and employed software
    - reservation of type approvals, individual approvals and periodic technical inspections
    - mandatory *inspection of software source code* in order to effectively rule out abuse
    - *regulation and administrative control of the use of artificial intelligence* in sensitive contexts
      - transparent algorithms to be approved by authorities
      - screening for hidden safety risks
      - screening for hidden discrimination (on grounds of race, sex or size, type or place of registration of the car etc.)
      - special problem: criteria and minimum standards for the reaction in dilemma situations (dodge the child on the road or prioritise the safety of the passengers?)
  - b) Strict limitation of personal data collection to what is necessary for the specific purpose
    - restriction of both, public and private data collection
    - restriction by mandatory law: the need of limits that cannot be overridden by "consent"
    - no misuse of the car's or infrastructure's equipment for external purposes - they must not become our personal spy!
    - strict prohibition of profiling
  - c) Strict separation of the collected personal data from those collected for other purposes
    - the need to prohibit the sharing or merging of personal data for other public missions or economic interests
    - exceptions in individual cases to avert imminent dangers for overriding paramount interests need to be regulated in the law, limited to what is absolutely necessary and subject to judicial approval and control
  - d) Strict liability (liability without fault) for the operation of autonomous vehicles, transport systems and traffic control systems
    - since these technologies entail as such a particular risk
    - problem: how to distribute the liability among the various users and operators, providers and producers involved?

### V. Conclusion

- while the shift to electrified vehicles does not represent a specific human rights problem, its combination with the broad use of Fourth Industrial Revolution technologies creates significant risks and raises difficult human rights issues
- some general solution approaches are obvious but numerous problems are waiting in the details and more approaches need to be developed - these problems will keep human rights lawyers busy for some time!

## Further Reading

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