

Rethinking Compensation in light of the development of AI

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1. Introduction: AI, liability and compensation

Artificial intelligence (AI) offers great opportunities, but also many legal challenges. The development of AI-systems will require new regulations and the revision of existing legal instruments. New safety requirements are needed to ensure only safe AI-systems will be available to the market, and the development of for instance self-driving cars necessitates new traffic rules. In addition, the opacity and complexity of AI-systems can make it challenging to assess why the system caused damage, what went wrong, and who should compensate the injured party for damage suffered.¹

To address the tort law issues that arise from this development, the European Commission has proposed an AI Liability Directive² and a revision of the Product Liability Directive³ in September 2022.⁴ The proposed revision of the Product Liability Directive would end the discussion on the status of software – yes, it is a product (art. 4 of the proposal) – and would provide rules on the burden of proof in product liability claims (art. 9). In case a liability claim is based on a fault liability, the proposed AI Liability Directive comes into play. In this proposed Directive, no rules on liability are established but rather the European Commission proposes rules on the burden of proof in fault-based liability claims (art. 3 and 4). These rules are similar to the rules on the burden of proof in the proposed new Product Liability Directive, and should help the claimant to prove either fault (AI Liability Directive) or defect (proposed Product Liability Directive).

In addition, the proposed new Product Liability Directive will no longer have an opt-out for Member States of the development risk defence, meaning that a manufacturer held liable for damage caused by his defective product will always have this defence at his disposal. In the proposed new Product Liability Directive, this defence reads:

‘An economic operator referred to in Article 7 shall not be liable for damage caused by a defective product if that economic operator proves any of the following: (...) (e) in the case of a manufacturer, that the objective state of scientific and technical knowledge at the time when the product was placed on the market, put into service or in the period in which the

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¹ European Commission, White Paper On Artificial Intelligence - A European approach to excellence and trust, COM(2020) 65 final, p. 10, 12-13, 15. See also Abbott et al./Expert Group on Liability and New Technologies New Technologies Formation, Liability for Artificial Intelligence and Other Emerging Digital Technologies, European Union, 2019, key findings 1, 3 and 4.

² European Commission, Proposal for a Directive of the European Parliament and of the Council on adapting non-contractual civil liability rules to artificial intelligence (AI Liability Directive), COM(2022) 496 final.

³ European Commission, Proposal for a Directive of the European Parliament and of the Council on liability for defective products, COM(2022) 495 final.

⁴ The proposed AI Act (Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain union legislative acts, COM(2021) 206 final), in conjunction with the Proposal for a Regulation of the European Parliament and of the Council on general product safety, amending Regulation (EU) No 1025/2012 of the European Parliament and of the Council, and repealing Council Directive 87/357/EEC and Directive 2001/95/EC of the European Parliament and of the Council (COM(2021) 346 final) for risks not covered by the AI Act, is an instrument to ensure only safe AI-systems can be brought onto the market.

product was within the manufacturer's control was not such that the defectiveness could be discovered.⁵

If the manufacturer invokes this defence successfully, the injured party will not be compensated for his damage via the proposed Product Liability Directive. In cases where the national legal framework or insurance does not provide another route to compensation to the injured party, he will not get compensated for the damage suffered. Such an outcome seems undesirable. However, the development risk defence is often seen as important for encouraging innovation. In other words, not having the development risk defence could hinder innovation, which also seems undesirable.

This all triggers a question: why not explore a bolder option to ensure compensation for damage caused by a defective AI-system? This paper will explore the option of designing a compensation fund to compensate for this damage, focusing on realizing the following recommendation to the European Commission of the Independent Expert Group on Ethics of Connected and Automated Vehicles (CAVs):

'Create fair and effective mechanisms for granting compensation to victims of crashes or other accidents involving CAVs. Clear and fair legal rules for assigning liability in the event that something goes wrong with CAVs should be created. This could include the creation of new insurance systems. These rules should balance the need for corrective justice, i.e. giving fair compensation to victims, with the desire to encourage innovation. They should also ensure a fair distribution of the costs of compensation. These systems of legal liability may sometimes work in the absence of culpability attributions (e.g. through "no fault" liability schemes).⁶

This recommendation is not just relevant in relation to CAVs, but to AI as a whole. Therefore, the main question addressed in this paper is: **Could a compensation fund provide for a balance between compensation for damage caused by AI-systems and the innovation in the field of AI (including economic development)?** To assess this, first the functions of liability law will be discussed briefly before exploring how some existing compensation funds have found a balance between compensation and innovation or the economic benefits of a dangerous activity. Several of these funds, from different jurisdictions, are discussed. Next, how a compensation fund for damage caused by AI-systems could be designed will be mapped out. This paper will end with some concluding remarks and thoughts on the option of having a compensation fund for damage caused by these AI-systems.

2. Functions of liability

Two of the main functions of tort or liability law are generally considered to be that of *compensation* and *prevention (or deterrence)*.⁷ When it comes to the latter, the prospect of liability can incentivize, for instance, developers of AI-systems to take precautions to avoid damage and liability for that

⁵ Art. 4(16) defines 'economic operator' as "the manufacturer of a product or component, the provider of a related service, the authorised representative, the importer, the fulfilment service provider or the distributor." In art. 7, the proposed Product Liability Directive lays down the circumstances under which a specific economic operator can be held liable.

⁶ Recommendation 20, Bonnefon et al., Ethics of Connected and Automated Vehicles. Recommendations on road safety, privacy, fairness, explainability, and responsibility, Publication Office of the European Union: Luxembourg, 2020.

⁷ The notions of 'tort' and 'liability' are used in this article to indicate extra-contractual liability excluding agency without authority and unjust enrichment. See Cees van Dam, *European Tort Law* (2nd edition, Oxford University Press 2013), p. 101-102.

damage caused by the AI-system. Unreasonable risk should thus be prevented.⁸ The European Group on Tort explicitly acknowledged the prevention function of tort law by stating in art. 10:101 of the Principles on European Tort Law: '(...) Damages also serve the aim of preventing harm.'⁹

Tort law's main function, however, is that of *compensation* as tort law strives to bring the injured party in the same economic position as before the harm was inflicted upon him.¹⁰ Compensation, therefore, does not (necessarily) have a punitive character. As discussed above, it is this function of *compensation* that might not be fulfilled because of difficulties relating to proving a(n AI-system's) wrongdoing or defect. The development risk defence could also hinder compensation from being achieved through liability law. It is for this reason that the option of a compensation fund for damage caused by (defective) AI-systems is explored in this paper, aiming to fulfil the compensatory function of tort law.

3. Compensation funds

The idea of a compensation fund for damage suffered is not a new one, quite on the contrary. There are already multiple functioning compensation funds across the world. Some of these funds – this is by no means an exhaustive list – will be discussed here to examine their scope, delineations and functioning to assess how a compensation fund for damage caused by (defective) AI-systems can take shape. Two of the discussed funds concern mainly environmental damage (maritime pollution, nuclear damage), three funds that provide compensation for damage suffered in a specific event (*Entschädigungsfonds für Schäden aus Kraftfahrzeugunfällen*, *Schadefonds Geweldsmisdrijven*, September 11th Victim Compensation Fund) and a very extensive compensation fund making parts of tort law obsolete (accident compensation scheme). These funds have in common that they have provided a balance between compensation and economic development (including preventing negative economic consequences) and could therefore provide inspiration on designing a compensation fund for damage caused by AI-systems.

3.1 Environmental damage

Maritime pollution: Oil Pollution Compensation fund

The United Kingdom's worst oil spill, caused by oil tanker Torrey Canyon running aground near Cornwall,¹¹ was reason for the international community to explore compensation and liability regimes concerning oil spills from tankers.¹² Two years after the Torrey Canyon disaster, in 1969, the International Maritime Organisation (IMO) adopted the Convention on Civil Liability for Oil Pollution

⁸ David Rosenberg, Decoupling Deterrence and Compensation Functions in Mass Tort Class Actions for Future Loss, *Virginia Law Review*, Dec., 2002, Vol. 88, No. 8, Symposium: Liability for Inchoate and Future Loss (Dec., 2002), pp. 1871-1919, p. 1880.

⁹ European Group on Tort Law, Principles on Tort Law, 2005, available via <http://www.egtl.org/docs/PETL.pdf>.

¹⁰ See for instance Christian Förster, 'BGB § 823 Schadensersatzpflicht', (*BeckOK BGB Hau/Poseck*, 65th edn, Beck online 2023), Rn 6-14; Willem H Van Boom, Compensating and Preventing Damage: Is There Any Future Left for Tort Law? (Summer 2005). Available at SSRN: <https://ssrn.com/abstract=942710> or <http://dx.doi.org/10.2139/ssrn.942710>, p. 1, 2, 5.

¹¹ Adam Vaughan, Torrey Canyon disaster – the UK's worst-ever oil spill 50 years on, *The Guardian* (online) 18 March 2017.

¹² Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 378; <https://iopcfunds.org/about-us/> [accessed 27 February 2023]; Albert Verheij, Shifts in Governance: Oil Pollution, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law* vol. 21, 2007 Springer Verlag Wien, p. 136; Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 37-38.

Damage (Civil Liability Convention).¹³ This Convention lays down strict liability rules¹⁴ for the owner of the ship causing the oil spill.¹⁵ However, it was noted that the Civil Liability Convention might not provide for full compensation to victims of pollution.¹⁶ Therefore, in 1971 the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention) was adopted, which established an international organization called the International Oil Pollution Compensation Fund (IOPC Fund).¹⁷ Protocols updated both Conventions, most drastically in 1992.¹⁸

It goes beyond the scope of this paper to delve deep into these two Conventions and their functioning.¹⁹ Here, only a brief description is provided against the backdrop of designing a compensation fund for damage caused by defective AI-systems.

The Civil Liability Convention puts liability for so-called pollution damage caused by an oil-carrying ship with the owner of that ship, unless the damage is caused by, for instance, an act of war, an exceptional and inevitable natural phenomenon or the negligence or wrongful act of an authority responsible for the maintenance of navigational aids.²⁰ This liability is therefore considered to be a strict liability.²¹ The owner is the person registered as such or, if no one is registered as owner, the person actually owning the ship.²² Pollution damage is defined as:

¹³ Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 378.

¹⁴ Compulsory insurance can be required, see art. VII Civil Liability Fund.

¹⁵ [https://www.imo.org/en/About/Conventions/Pages/International-Convention-on-Civil-Liability-for-Oil-Pollution-Damage-\(CLC\).aspx#:~:text=International%20Convention%20on%20Civil%20Liability%20for%20Oil%20Pollution%20Damage%20\(CLC\),-Home&text=The%20Civil%20Liability%20Convention%20was,casualties%20involving%20oil%2Dcarrying%20ships](https://www.imo.org/en/About/Conventions/Pages/International-Convention-on-Civil-Liability-for-Oil-Pollution-Damage-(CLC).aspx#:~:text=International%20Convention%20on%20Civil%20Liability%20for%20Oil%20Pollution%20Damage%20(CLC),-Home&text=The%20Civil%20Liability%20Convention%20was,casualties%20involving%20oil%2Dcarrying%20ships).

¹⁶ Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 378.

¹⁷ Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 378.

¹⁸ Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 378.

¹⁹ See more extensively for instance Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996 and Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2) and Albert Verheij, Shifts in Governance: Oil Pollution, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law* vol. 21, 2007 Springer Verlag Wien, p. 136.

²⁰ Art. III Civil Liability Convention. See also Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 59-62, 86.

²¹ Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 58-62; Albert Verheij, Shifts in Governance: Oil Pollution, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law* vol. 21, 2007 Springer Verlag Wien, p. 137; Mans Jacobsson, Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 379.

²² Art. I(4) Civil Liability Convention.

“Pollution damage” means:

- (a) loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship, wherever such escape or discharge may occur, provided that compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken;
- (b) the costs of preventive measures and further loss or damage caused by preventive measures.²³

Preventive measures are reasonable measures taken to prevent or minimize pollution damage and include clean-up and restoration.²⁴ Personal injury is compensable under the Civil Liability Convention, but this is not the case for exposure to health risk or anxiety.²⁵ Damage to property also falls within the scope of the Civil Liability Convention.²⁶ Those who suffer the pollution damage or have taken preventive measures are entitled to compensation under this Convention.²⁷ The Civil Liability Convention has a limited territorial scope:

‘This Convention shall apply exclusively:

- (a) to pollution damage caused:
 - (i) in the territory, including the territorial sea, of a Contracting State, and
 - (ii) in the exclusive economic zone of a Contracting State, established in accordance with international law, or, if a Contracting State has not established such a zone, in an area beyond and adjacent to the territorial sea of that State determined by that State in accordance with international law and extending not more than 200 nautical miles from the baselines from which the breadth of its territorial sea is measured;
- (b) to preventive measures, wherever taken, to prevent or minimize such damage.²⁸

The IOPC Fund, established by the Fund Convention, is complementary to the Civil Liability Convention as it provides for a supplementary compensation.²⁹ It applies to pollution damage in the

²³ Art. I(6) Civil Liability Convention. See Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p.46-49 for an extensive analysis.

²⁴ Art. I(7) Civil Liability Convention. See for more details on preventative measures, among others, Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 49-50; Albert Verheij, *Shifts in Governance: Oil Pollution*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage*, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 138-139.

²⁵ Albert Verheij, *Shifts in Governance: Oil Pollution*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage*, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 138.

²⁶ Albert Verheij, *Shifts in Governance: Oil Pollution*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage*, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 138.

²⁷ Albert Verheij, *Shifts in Governance: Oil Pollution*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage*, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 138.

²⁸ Art. II Civil Liability Convention.

²⁹ Fund Convention Preamble and art. 2; Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 76; Albert Verheij, *Shifts in Governance: Oil Pollution*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage*, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 141; Mans Jacobsson, *Compensation for oil pollution*

territory (including the territorial sea) of a Contracting State and in the exclusive economic zone of that state and it applies to preventive measures regardless of where these measures were taken.³⁰ In short, the fund pays compensation to any person for pollution damage suffered if this person has been unable to get full compensation under the Civil Liability Convention because no liability has arisen from this Convention, the liable ship owner is financially unable to pay compensation or the damage exceeds what the owner is liable for.³¹ If the person suffering damage is unable to prove his damage resulted from an incident involving one or more ships or the pollution damage has been caused by, for instance, an act of war, the Fund does not have to compensate this damage.³² When the person suffering the pollution damage has contributed or caused the damage by his own act or omission or negligence, the Fund 'may be exonerated wholly or partially from its obligation to pay compensation to such person.'³³ In addition, the Fund Convention sets out, among other things, limitations to the aggregated amount of compensation and a limitation period.³⁴

In art. 10 of the Fund Convention, the rules on the contributions to the Fund are laid out:

'Annual contributions to the Fund shall be made in respect of each Contracting State by any person who, in the calendar year referred to in Article 12, paragraph 2(a) or (b), has received in total quantities exceeding 150,000 tons:

- (a) in the ports or terminal installations in the territory of that State contributing oil carried by sea to such ports or terminal installations; and
- (b) in any installations situated in the territory of that Contracting State contributing oil which has been carried by sea and discharged in a port or terminal installation of a non-Contracting State, provided that contributing oil shall only be taken into account by virtue of this sub-paragraph on first receipt in a Contracting State after its discharge in that non-Contracting State.'³⁵

damage caused by oil spills from ships and the international oil pollution compensation fund, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 379.

³⁰ Art. 3 Fund Convention.

³¹ Art. 4(1) Fund Convention.

³² Art. 4(2) Fund Convention. This does not include force majeure. See also Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 83-86; Mans Jacobsson, *Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund*, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 380.

³³ Art. 4(3) Fund Convention.

³⁴ Art. 4(4), art. 4(5) and art. 6 Fund Convention. See on the limits of compensation: Mans Jacobsson, *Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund*, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 380.

³⁵ Art. 10(1) Fund Convention. Art. 12(2) reads: '2. The Assembly shall decide the total amount of contributions to be levied. On the basis of that decision, the Director shall, in respect of each Contracting State, calculate for each person referred to in Article 10 the amount of his annual contribution: (a) in so far as the contribution is for the satisfaction of payments referred to in paragraph 1(i)(a) and (b) on the basis of a fixed sum for each ton of contributing oil received in the relevant State by such persons during the preceding calendar year; and (b) in so far as the contribution is for the satisfaction of payments referred to in paragraph 1(i)(c) of this Article on the basis of a fixed sum for each ton of contributing oil received by such person during the calendar year preceding that in which the incident in question occurred, provided that State was a Party to this Convention at the date of the incident.'

Thereby, those benefitting from oil transport via the sea – oil companies – bear the financial burden of the Fund.³⁶ Chao explains that the value of 150,000 tonnes has the effect that the main contributors to the fund are the major oil companies.³⁷ As Jacobsson describes, ‘Contributing oil is counted for contribution purposes each time it is received at ports or terminal installations in a Fund member State after carriage by sea.’³⁸ Therefore, the place of loading of the oil into the ship is irrelevant.³⁹ The Contracting States has to report to the Fund all parties in its territory that are required to contribute to the Fund.⁴⁰

Compensation for Nuclear damage

Besides the International Oil Pollution Compensation Fund, there are more ways to compensate for environmental damage. For instance, there are multiple international legal instruments governing the liability and compensation in case of nuclear damage. Here, the focus lies on two of the instruments developed under the auspices of the International Atomic Energy Agency: the Vienna Convention on Civil Liability for Nuclear Damage (hereinafter: Vienna Convention) and the Convention on Supplementary Compensation for Nuclear Damage.⁴¹ In brief, the Vienna Convention outs a strict liability for nuclear damage caused by a nuclear incident with the operator of a nuclear installation.⁴² The operator of a nuclear installation is the person who is designated or is being recognized as such by the Installation State.⁴³ Nuclear damage includes the loss of life, personal injury and loss of or damage to property.⁴⁴

³⁶ See also Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 54, 76ff.

³⁷ Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation*, Kluwer Law International 1996, p. 96.

³⁸ Mans Jacobsson, *Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund*, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 380.

³⁹ Mans Jacobsson, *Compensation for oil pollution damage caused by oil spills from ships and the international oil pollution compensation fund*, *Marine Pollution Bulletin*, Volume 29, Issues 6–12, 1994, Pages 378-384, [https://doi.org/10.1016/0025-326X\(94\)90657-2](https://doi.org/10.1016/0025-326X(94)90657-2), p. 380-381.

⁴⁰ Art. 15 Fund Convention. See also art. 14 Fund Convention.

⁴¹ In addition to these and other instruments developed by this agency, several other instruments have been developed by the OECD Nuclear Energy Agency. See Tom Borre, *Shifts in Governance in Compensation for Nuclear Damage, 20 Years after Chernobyl*, in: Michael Faure and Albert Verheij (eds.), *Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law vol. 21*, 2007 Springer Verlag Wien, p. 267-280. The the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage have been accessed via www-pub.iaea.org/MTCD/Publications/PDF/P1768_web.pdf [last accessed 2 March 2023].

⁴² Art. II Vienna Convention.

⁴³ Art. I(1)(c) Vienna Convention. Art. I(1)(d) Vienna Convention describes “‘Installation State”, in relation to a nuclear installation, means the Contracting Party within whose territory that installation is situated or, if it is not situated within the territory of any State, the Contracting Party by which or under the authority of which the nuclear installation is operated.’

⁴⁴ Art. I(1)(k) Vienna Convention: “‘Nuclear Damage” means

(i) loss of life or personal injury;

(ii) loss of or damage to property;

and each of the following to the extent determined by the law of the competent court

(iii) economic loss arising from loss or damage referred to in sub-paragraph (i) or (ii), insofar as not included in those sub-paragraphs, if incurred by a person entitled to claim in respect of such loss or damage;

(iv) the costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in sub-paragraph (ii);

(v) loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as not included in subparagraph (ii);

As follows from art. I A of the Vienna Convention, is the Vienna Convention in principle applicable to nuclear damage irrespective of where the damage was suffered.⁴⁵ The operator is obliged to take out insurance that covers his liability for nuclear damage, but the Vienna Convention does offer the possibility for the Installation State to limit the amount to which the operator can be held liable.⁴⁶ Art. V(1) Vienna Convention requires public funds to be made available to ensure the coverage up to a certain amount.⁴⁷ The persons suffering nuclear damage 'may enforce their rights to compensation without having to bring separate proceedings according to the origin of the funds provided for such compensation.'⁴⁸ The Convention on Supplementary Compensation for Nuclear Damage supplements both the compensation schemes of the Vienna Convention and of the Paris Convention on Third Party Liability in the Field of Nuclear Energy (designed under the auspices of the Nuclear Energy Agency, not further discussed here), as well as national law which complies with certain provisions of the Annex of this Convention.⁴⁹ Installation States have to make funds available for compensation in respect of nuclear damage per nuclear incident and Contracting Parties have to contribute to a certain amount to an international fund.⁵⁰

Although this differs substantially from a compensation fund like the IOPC Fund discussed above, one could argue that the public funds made available and the international fund to which Contracting Parties to the Convention on Supplementary Compensation for Nuclear Damage have to contribute, have a similar function to a compensation fund, as they ensure the (full) compensation of damage suffered. Instead of having private parties contributing to a compensation fund and thereby collectively bearing the financial burden of liability and compensation, here it is the Installation State sharing in that burden. This is an option that should be considered when designing a compensation fund for damage caused by AI-systems.

3.2 Victim compensation funds

Next to the funds discussed above concerning environmental disasters and the regime under the Vienna Convention concerning nuclear damage, there are also compensation funds that under specific circumstances cover damage caused to a victim of a road traffic accident, the victim of a

(vi) the costs of preventive measures, and further loss or damage caused by such measures;
(vii) any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court,
in the case of sub-paragraphs (i) to (v) and (vii) above, to the extent that the loss or damage arises out of or results from ionizing radiation emitted by any source of radiation inside a nuclear installation, or emitted from nuclear fuel or radioactive products or waste in, or of nuclear material coming from, originating in, or sent to, a nuclear installation, whether so arising from the radioactive properties of such matter, or from a combination of radioactive properties with toxic, explosive or other hazardous properties of such matter'

⁴⁵ See also Tom Borre, Shifts in Governance in Compensation for Nuclear Damage, 20 Years after Chernobyl, in: Michael Faure and Albert Verheij (eds.), Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 284.

⁴⁶ Art. VII, art. V Vienna Convention. See also Tom Borre, Shifts in Governance in Compensation for Nuclear Damage, 20 Years after Chernobyl, in: Michael Faure and Albert Verheij (eds.), Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 284-285.

⁴⁷ Tom Borre, Shifts in Governance in Compensation for Nuclear Damage, 20 Years after Chernobyl, in: Michael Faure and Albert Verheij (eds.), Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 287.

⁴⁸ Art. V B Vienna Convention.

⁴⁹ Art. II(1) Convention on Supplementary Compensation for Nuclear Damage.

⁵⁰ Art. III and IV Convention on Supplementary Compensation for Nuclear Damage. See in more detail: Tom Borre, Shifts in Governance in Compensation for Nuclear Damage, 20 Years after Chernobyl, in: Michael Faure and Albert Verheij (eds.), Shifts in Compensation for Environmental Damage, ECTIL Tort and Insurance Law vol. 21, 2007 Springer Verlag Wien, p. 291-293.

violent crime and damage caused to a victim in a specific damaging event. Three examples are discussed below, before exploring a compensation fund with a very extensive coverage in the next section.

Road traffic accidents

Next to a framework for compulsory motor vehicle insurance, EU Member States are required by the EU Motor Insurance Directive to set up or authorize a body with compensation of damage caused by an unidentified vehicle or a vehicle that was not insured.⁵¹ This body should provide compensation within the limits of what the mandatory insurance would otherwise have covered.⁵²

For providing this compensation, Germany has developed the *Entschädigungsfonds für Schäden aus Kraftfahrzeugunfällen*, a guarantee or compensation fund.⁵³ This fund provides compensation for personal injury, damage to property and other financial losses caused by the use of a vehicle⁵⁴ if, for instance, the vehicle causing damage cannot be identified, there was no mandatory insurance taken out or the mandatory insurance does not cover compensation for the damage suffered (e.g. in case of intent by the driver).⁵⁵ Contributions to the fund are being made by, among others, the insurance companies. The amount contributed is being assessed by taking into account their share in the total stock of vehicles and the type of these vehicles.⁵⁶ This way, the injured party will not remain without compensation for the damage suffered, and the compensation costs are being spread out over a number of insurers.

Violent crimes

An example of a compensation fund in the context of violent crimes can be found in, among other countries, the Netherlands: the *Schadefonds Geweldsmisdrijven* (translated: violent crime claims fund). The *Schadefonds Geweldsmisdrijven* is established by the *Wet schadefonds geweldsmisdrijven* (violent crime claims fund act) (hereinafter: WSG).⁵⁷ Individuals are eligible for benefits from the fund when they, for instance, have suffered serious physical injury or mental injury as a result from an intentionally committed violent crime within the Netherlands.⁵⁸ Relatives and loved ones can also be eligible for a payment from the fund if the person has suffered permanent physical injury or has died

⁵¹ Art. 3, 10 Directive 2009/103/EC of the European Parliament and of the Council of 16 September 2009 relating to insurance against civil liability in respect of the use of motor vehicles, and the enforcement of the obligation to insure against such liability (Motor Insurance Directive).

⁵² Art. 10 Motor Insurance Directive.

⁵³ §12 Gesetz über die Pflichtversicherung für Kraftfahrzeughalter (Pflichtversicherungsgesetz). See also the Verordnung über den Entschädigungsfonds für Schäden aus Kraftfahrzeugunfällen. See more extensively Schneider, Kapitel 13. Rechtsverhältnis zwischen Versicherungsnehmer, Versicherer und Geschädigtem beim Haftpflichtversicherungsvertrag, in: Geigel, Haftpflichtprozess, 28. Auflage 2020, Rn 86-93.

⁵⁴ §1 Pflichtversicherungsgesetz: '(...) durch den Gebrauch des Fahrzeugs verursachten Personenschäden, Sachschäden und sonstigen Vermögensschäden (...).'

⁵⁵ §12 Abs. 1 Pflichtversicherungsgesetz.

⁵⁶ §13 Abs. 1 Pflichtversicherungsgesetz: '(...) Die im Geltungsbereich dieses Gesetzes zum Betrieb der Kraftfahrzeug-Haftpflichtversicherung befugten Versicherungsunternehmen und die Haftpflichtschadenausgleiche im Sinne von § 3 Absatz 1 Nummer 4 des Versicherungsaufsichtsgesetzes sowie die nach § 2 Nrn. 1 bis 4 von der Versicherungspflicht befreiten Halter nichtversicherter Fahrzeuge sind verpflichtet, unter Berücksichtigung ihres Anteils am Gesamtbestand der Fahrzeuge und der Art dieser Fahrzeuge an die Anstalt Beiträge zur Deckung der Entschädigungsleistungen und der Verwaltungskosten zu leisten. (...).'

⁵⁷ Art. 1 WSG (available via <https://wetten.overheid.nl/BWBR0002979/2020-01-01> [accessed 16 March 2023]).

⁵⁸ Art. 3 lid 1 sub a WSG.

as a result of the crime.⁵⁹ A committee decides upon a request on whether and to what amount compensation will be paid from the fund.⁶⁰ The amount of the payment will be determined on a fair and reasonable basis and will not exceed the damage suffered.⁶¹ The Schadefonds Geweldsmisdrijven provides a list of injuries, indicating their severity and the maximum height of the payment.⁶² A payment is done on the condition that the damage has not and will not be compensated by other means (e.g. a civil liability claim).⁶³ The Schadefonds Geweldsmisdrijven receives funding from the Dutch Ministry of Justice and Security.⁶⁴ The Schadefonds Geweldsmisdrijven is thereby an example of a compensation fund that is funded by the government

Terrorist attack

On September 11th, 2001, terrorists caused two aeroplanes to crash into the Twin Towers in New York City (USA) and one aeroplane in the Pentagon (Arlington, Virginia, USA), a fourth aeroplane crashed near Shanksville, Pennsylvania (USA).⁶⁵ Almost 3,000 people lost their lives in the attacks, many more were injured.⁶⁶ In order to protect the airline industry, the US Congress established the September 11th Victim Compensation Fund less than two weeks after the attacks.⁶⁷ When registering for compensation from the fund, one has to waive their right to file a civil action:

‘When you submit a VCF claim, you waive your right to file a civil action (or to be a party to an action) in any federal or state court for damages sustained as a result of the terrorist-related aircraft crashes of 9/11, or for damages arising from or related to debris removal.’⁶⁸

Diller describes how this Fund through this waiver substitutes the tort system and protects the airline industry.⁶⁹ Those deciding not to claim from the Fund but file a civil action had to deal with several limitations in order to protect the airline industry (no claims were allowed above the amount covered by the airline’s insurance) and other parties involved (like New York City).⁷⁰ The Fund strives

⁵⁹ Art. 3 lid 1 sub c WSG. See art. 3 lid 2 WSG for a description of whom are considered to be a relative or loved one for the purpose of the Schadefonds Geweldsmisdrijven.

⁶⁰ Art. 8 WSG, see also <https://www.schadefonds.nl/schadefonds/wet-en-beleid/> [accessed 16 March 2023].

⁶¹ Art. 4 WSG, see also art. 6 WSG.

⁶² www.schadefonds.nl/wp-content/uploads/2022/11/Letsellijst-Schadefonds-Geweldsmisdrijven-1-november-2022.pdf [accessed 16 March 2023].

⁶³ Art. 6 lid 2 WSG.

⁶⁴ www.schadefonds.nl/schadefonds/ [accessed 16 March 2023]. In criminal proceedings, a judge can impose a compensation measure on the suspect, which benefits the State. (art. 36f Wetboek van Strafrecht).

⁶⁵ Serge Schemann, U.S. ATTACKED; President Vows to Exact Punishment for 'Evil', *New York Times* 12 September 2001, accessed online via www.nytimes.com/2001/09/12/us/us-attacked-president-vows-to-exact-punishment-for-evil.html [accessed 28 February 2023].

⁶⁶ www.911memorial.org/connect/commemoration [accessed 28 February 2023].

⁶⁷ Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 143.

⁶⁸ There is a similar waiver concerning deceased individuals, see for both waivers www.vcf.gov/policy/eligibility-criteria-and-deadlines [accessed 28 February 2023].

⁶⁹ Matthew Diller, *Tort and Social Welfare Principles in the Victim Compensation Fund*, 53 DEPAUL L. REV. 719 (2003), p. 721, 723. See also Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 145. See on more measures taken to stabilise the airline industry: Richard P. Campbell, *The September 11th Attack on America: Ground Zero in Tort and Insurance Law*, 9 CONN. INS. L.J. 51 (2002), p. 56-59.

⁷⁰ Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 145.

for full compensation of the victims.⁷¹ Ackerman summarizes the core provisions of the September 11th Victim Compensation Fund:

‘Those who had suffered physical injury and families of those who had died in the attacks on the World Trade Center, the Pentagon, and in the crash of United Airlines Flight 93 near Shanksville, Pennsylvania would be entitled to compensation on a no-fault basis.’⁷²

For those injured in the attacks, there is a list of conditions that are presumptively covered by the Fund.⁷³ This list includes conditions like mesothelioma, and other types of cancer, musculoskeletal disorders, acute traumatic injuries, respiratory disorders and so on.⁷⁴ Mental illness without any physical injury is not compensable under the September 11th Victim Compensation Fund.⁷⁵ A ‘Special Master’ decides, among other things, on the extent of the harm (including non-economic losses) and the amount of compensation that is to be awarded.⁷⁶

3.3 Other compensation funds

The discussed compensation funds are by no means all compensation funds available. This serves merely as an indication of what type of compensation funds are out there and what their conditions, requirements and limitations are, so as to provide inspiration for designing a (hypothetical) compensation fund for damage caused by AI-systems. One fund that should therefore also be discussed here is the very extensive accident compensation scheme in 1974 in New Zealand.⁷⁷

Five elements are central to this accident compensation scheme: community responsibility, comprehensive entitlement, complete rehabilitation, real compensation and administrative efficiency.⁷⁸ O’Sullivan and Tokeley summarise: ‘The scheme is based on the philosophy that accidents will always happen and society as a whole should be responsible for compensating those who suffer personal injury or death by accident.’⁷⁹ The current Accident Compensation Act

⁷¹ Matthew Diller, *Tort and Social Welfare Principles in the Victim Compensation Fund*, 53 DEPAUL L. REV. 719 (2003), p. 720; Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 145-146.

⁷² Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 144.

⁷³ www.vcf.gov/policy/eligibility-criteria-and-deadlines [accessed 28 February 2023].

⁷⁴ www.vcf.gov/policy/eligibility-criteria-and-deadlines [accessed 28 February 2023].

⁷⁵ www.vcf.gov/policy/eligibility-criteria-and-deadlines#14e [accessed 28 February 2023]. See also Richard P. Campbell, *The September 11th Attack on America: Ground Zero in Tort and Insurance Law*, 9 CONN. INS. L.J. 51 (2002), p. 59.

⁷⁶ Richard P. Campbell, *The September 11th Attack on America: Ground Zero in Tort and Insurance Law*, 9 CONN. INS. L.J. 51 (2002), p. 59-60; Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 144.

⁷⁷ Connell, S. (2019). Community insurance versus compulsory insurance: Competing paradigms of no-fault accident compensation in New Zealand. *Legal Studies*, 39(3), 499-516. doi:10.1017/lst.2018.50, p. 499-500. Bronwyn Howell, Judy Kavanagh and Lisa Marriott, ‘No-Fault Public Liability Insurance: Evidence from New Zealand’ (2002) 9 *Agenda: A Journal of Policy Analysis and Reform* 135, 138-142.

⁷⁸ Report of the Royal Commission. (1967). *Compensation for personal injury in New Zealand*. Wellington: Government Printer (‘The Woodhouse Report’), p. 39, available via <https://fyi.org.nz/request/10548/response/35311/attach/4/Woodhouse%20Report%20Compensation%20for%20Personal%20Injury%20in%20NZ.pdf> [accessed 16 March 2023]. See also section 3 ACC.

⁷⁹ Trish O’Sullivan & Kate Tokeley, *Consumer Product Failure Causing Personal Injury under the No-Fault Accident Compensation Scheme in New Zealand - A Let-off for Manufacturers?*, 41 *J. Consumer POL’y* 211 (2018), p. 212.

(hereinafter: ACC) stems from 2001.⁸⁰ It allows for the compensation of personal injury (not damage to property) suffered in New Zealand on a no-fault basis.⁸¹ Personal injury is described as:

‘Personal injury means—

- (a) the death of a person; or
- (b) physical injuries suffered by a person, including, for example, a strain or a sprain; or
- (c) mental injury suffered by a person because of physical injuries suffered by the person; or
- (d) mental injury suffered by a person in the circumstances described in section 21; or
- (da) work-related mental injury that is suffered by a person in the circumstances described in section 21B; or
- (e) damage (other than wear and tear) to dentures or prostheses that replace a part of the human body.’⁸²

Personal injury caused in, among other cases, the following circumstances is covered by the ACC:

- ‘(a) personal injury caused by an accident to the person: (...)
- (d) personal injury that is a consequence of treatment given to the person for another personal injury for which the person has cover:
- (e) personal injury caused by a work-related gradual process, disease, or infection suffered by the person:
- (f) personal injury caused by a gradual process, disease, or infection that is treatment injury suffered by the person:
- (g) personal injury caused by a gradual process, disease, or infection consequential on personal injury suffered by the person for which the person has cover:
- (h) personal injury caused by a gradual process, disease, or infection consequential on treatment given to the person for personal injury for which the person has cover:
- (i) personal injury that is a cardiovascular or cerebrovascular episode that is treatment injury suffered by the person: (...).’⁸³

The damage suffered, including entitlements of spouses and children of a person who died as a result of personal injuries,⁸⁴ is compensated by a fund, to which a number of parties contribute. Levies are being paid by, for instance, employers, workers and motor vehicle users.⁸⁵ The levies are linked to risks,⁸⁶ as for instance the person who drives more has to contribute more to the ACC via fuel tax.⁸⁷ This way, tort law has been set aside with regards to personal injury covered by the fund.⁸⁸ As O’Sullivan and Torkeley emphasise: ‘The no-fault foundation of the scheme means that citizens are

⁸⁰ Accessed via <https://www.legislation.govt.nz/act/public/2001/0049/latest/DLM99494.html> [accessed 16 March 2023].

⁸¹ Section 20 sub 1 ACC.

⁸² Section 26 sub 1 ACC. Section 21 ACC is about mental injury caused by certain criminal acts.

⁸³ Section 20 sub 2 ACC. See section 25 of the ACC for a definition of ‘accident’.

⁸⁴ Section 63 ff ACC.

⁸⁵ See Part 6 of the ACC.

⁸⁶ Connell, S. (2019). Community insurance versus compulsory insurance: Competing paradigms of no-fault accident compensation in New Zealand. *Legal Studies*, 39(3), 499-516. doi:10.1017/lst.2018.50, p. 508.

⁸⁷ Section 214 sub 4 ACC.

⁸⁸ Section 317 ACC; Connell, S. (2019). Community insurance versus compulsory insurance: Competing paradigms of no-fault accident compensation in New Zealand. *Legal Studies*, 39(3), 499-516. doi:10.1017/lst.2018.50, p. 499-500.

barred from suing an at-fault party for compensatory damages for personal injury.⁸⁹ Whether a compensation fund for damage caused by an AI-system should also go this far, remains to be seen. Below some options will be explored on what a compensation fund for damage caused by AI-systems could look like, taking inspiration from the ACC and the other compensation funds discussed above.

4. A compensation fund for damage caused by AI systems

4.1 Purpose and aim of a compensation fund

A compensation fund for damage caused by AI-systems could have several aims, just as the compensation funds discussed above. Repeating elements of those funds, however, are full compensation and distribution of the responsibilities/risks involved. In other words: those suffering damage should be fully compensated by a community of stakeholders (or society as a whole; this will be discussed below) so as to spread the liability risks out over more than just a singular stakeholder.

Full compensation needs little elaboration, as it is one of the main functions of tort law. An injured party should be compensated for his damage, so as to put him (as much as possible, as not all damage is reversible) in the situation he was in before he suffered the damage. All compensation funds discussed above support this aim; extra instruments have been developed to ensure full compensation of environmental damage suffered. An activity that benefits society –eminently the case with sea transport of oil and the production of nuclear energy - but exposes individuals to the risk of damage should be balanced out by full indemnification of those suffering the negative consequences of the realisation of those risks.

Full compensation requires payment of that compensation by actors involved. However, having one actor or stakeholder paying compensation for an activity that benefits society as a whole might not be suitable. Why does only one stakeholder have to carry this burden if his colleague-stakeholders also reap the benefits of participating in the specific potentially damaging activity (sea transport of oil, development of nuclear energy, taking part in road traffic, etc.)? Community responsibility or the distribution of liability risks could spread the costs over all parties involved. The Woodhouse Report on the ACC describes community responsibility (here in relation to the work force) as follows:

‘If the well-being of the work force is neglected, the economy must suffer injury. For this reason the nation has not merely a clear duty but also a vested interest in urging forward the physical and economic rehabilitation of every adult citizen whose activities bear upon the general welfare. This is the plain answer to any who might query the responsibility of the community in the matter. Of course, the injured worker himself has a moral claim, and further a more material claim based upon his earlier contribution, or his readiness to contribute to the national product. But the whole community has a very real stake in the matter. There is nothing new in this idea. It is something which for 30 years in New Zealand has been recognised for every citizen in the country in the area of medical and health services.’⁹⁰

This does not only spread the costs between those reaping benefits from the risk involved in a potentially damaging activity or development (here: the use of an AI-system), it can also contribute

⁸⁹ Trish O'Sullivan & Kate Tokeley, *Consumer Product Failure Causing Personal Injury under the No-Fault Accident Compensation Scheme in New Zealand - A Let-off for Manufacturers?*, 41 *J. Consumer POL'y* 211 (2018), p. 215.

⁹⁰ Report of the Royal Commission. (1967). *Compensation for personal injury in New Zealand*. Wellington: Government Printer ('The Woodhouse Report'), p. 20, available via <https://fyi.org.nz/request/10548/response/35311/attach/4/Woodhouse%20Report%20Compensation%20for%20Personal%20Injury%20in%20NZ.pdf> [accessed 16 March 2023].

to the likelihood of full compensation: an injured party does not suffer the financial consequences of a bankrupt liable stakeholder or of a liable stakeholder that cannot be identified. The latter is similar to, for instance, the *Entschädigungsfonds für Schäden aus Kraftfahrzeugunfällen*. The spreading of the liability risks is a strong element we have seen in the overview of the OIPC fund. And just as with the fund for covering nuclear damage suffered, there is a strong case to be made for the use of AI in society just as there is for the production of nuclear energy. As described by O’Sullivan and Tokeley in relation to the ACC,⁹¹ accidents will always happen and society as a whole should be responsible for compensating those who suffer personal injury or death by accident.⁹² Adding to this: it is society as a whole that benefits from the development of AI-systems, so the negative consequences should also be distributed over society (or at least over part of society). This would also justify the distribution of the liability risks over stakeholders (or a society as a whole) contributing to the fund and the protection of the injured party by ensuring full compensation through the fund. Therefore, two key elements of the design of a compensation fund for damage caused by AI are:

- community responsibility
- full compensation

With this in mind, we can now start drafting the requirements and conditions for the hypothetical fund further, and explore whether this fund could find a balance between compensation and innovation in relation to AI.

4.2 Definitions and delineation

AI-system

This contribution started with the European Commission’s proposals for an AI Liability Directive and a revision of the Product Liability Directive. However, this is not all when it comes to legislative proposals concerning technologies like AI: already in 2021 the Commission has proposed the so-called AI Act.⁹³ This proposed regulation contains, among other things, requirements for AI-systems depending on their risk level. It could therefore be compelling to align the compensation fund with the proposed AI Act and its EU-wide scope.

Consequently, adopting the same definition for AI-system would be most logical. The AI Act provides the following definition:

“artificial intelligence system’ (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with.”⁹⁴

⁹¹ See for a proposed AI ACC-type no-fault social insurance financed from general tax revenues in the context of the United States: Jin Yoshikawa, *Sharing the Costs of Artificial Intelligence: Universal No-Fault Social Insurance for Personal Injuries*, 21 *VAND. J. ENT. & TECH. L.* 1155 (2019). See for a compensation fund for damage caused by automated vehicles: Carrie Schroll, *Splitting the Bill: Creating a National Car Insurance Fund to Pay for Accidents in Autonomous Vehicles*, 109 *Nw. U. L. Rev.* 803 (2015) and Nynke E Vellinga, *Old Products, New Risks: The Findings of the New Technologies Formation and Automated Driving*, *Illyrius - International Scientific Review* 2022(18), 59-71, p. 67-69

⁹² Trish O’Sullivan & Kate Tokeley, *Consumer Product Failure Causing Personal Injury under the No-Fault Accident Compensation Scheme in New Zealand - A Let-off for Manufacturers?*, 41 *J. Consumer POL’y* 211 (2018), p. 212.

⁹³ Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (artificial intelligence act) and amending certain Union legislative acts, COM/2021/206 final.

⁹⁴ Atr. 3(1) AI Act.

At the time of writing, three techniques and approaches were listed in Annex I of the AI Act:

‘(a) Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning;

(b) Logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems;

(c) Statistical approaches, Bayesian estimation, search and optimization methods.’

The definition for AI-systems thereby covers a wide range of systems. This could be taken as a starting point for the compensation fund, but it could make the compensation fund too broad: to have damage caused by every AI-system under the definition provided by the AI Act covered by the compensation fund risks to be deemed too excessive. There might be a disconnect between the relatively low safety requirements from the AI Act for a specific AI-system and the contributions to and compensation by the fund. Paying contributions to the fund and the risks involved in bringing the AI-system to the market or using the system must be balanced as otherwise innovation could be discouraged. That is not the point of the fund.

The scope of the fund could be limited by choosing to only cover damage caused by a *high-risk* AI-system. This ties in with the stringent requirements the AI Act sets for these high-risk system and also conveys that although the AI-systems might be high-risk, there is still a societal benefit from these systems. Community responsibility would then lead to distribution of the liability risks involved.

The AI Act defines a high-risk AI system in art. 6 as:

‘1. Irrespective of whether an AI system is placed on the market or put into service independently from the products referred to in points (a) and (b), that AI system shall be considered high-risk where both of the following conditions are fulfilled:

(a) the AI system is intended to be used as a safety component of a product, or is itself a product, covered by the Union harmonisation legislation listed in Annex II;

(b) the product whose safety component is the AI system, or the AI system itself as a product, is required to undergo a third-party conformity assessment with a view to the placing on the market or putting into service of that product pursuant to the Union harmonisation legislation listed in Annex II.

2. In addition to the high-risk AI systems referred to in paragraph 1, AI systems referred to in Annex III shall also be considered high-risk.’

Although this is quite a complex definition, for reasons of consistency it would still be logical to link the compensation fund to the AI Act and its framework of definitions. New definitions would only convolute matters unnecessarily.

Defining damage

For the compensation fund covering damage caused by AI-systems to function properly, it is necessary to establish a definition of the notion of ‘damage’. Here, the AI Act remains silent. The European Commission, however, not: in the proposed new Product Liability Directive,⁹⁵ the Commission does provide a definition of damage:

⁹⁵ The proposed AI Liability Directive, however, does not include a definition for ‘damage’.

“damage’ means material losses resulting from:

- (a) death or personal injury, including medically recognised harm to psychological health;
- (b) harm to, or destruction of, any property, except:
 - (i) the defective product itself;
 - (ii) a product damaged by a defective component of that product;
 - (iii) property used exclusively for professional purposes;
- (c) loss or corruption of data that is not used exclusively for professional purposes;⁹⁶

The definition clearly shows that the (proposal for a revised) Product Liability Directive has a strong consumer protection purpose. This is not so much the case for the compensation fund. Like with many of the compensation funds discussed above, the scope of this compensation fund for damage caused by a high-risk AI-system could be limited to personal and mental injury, leaving the compensation of damage to property up to tort law. By focusing on personal and mental injuries, this does justice to the negative impact this type of damage can have on society in the form of high societal costs (due to healthcare required, absence from work, etc.).⁹⁷ This also avoids lengthy discussion on property damage slowing down the process of getting compensated by the fund. In addition, lists on compensable personal and mental injury, like the list of conditions that are presumptively covered by the September 11th Victim Compensation Fund, could prove beneficial in the efficient handling of claims and would provide legal certainty. Whether loss or corruption of data should be compensated by the fund requires more clarity on what this type of damage actually entails and what challenges it poses.

Summarising, this would lead to the following definition for damage covered by the compensation fund for damage caused by AI-systems: ‘damage’ means material losses resulting from death or personal injury, including medically recognised harm to psychological health.⁹⁸ The link with EU (proposed) legislation therefore remains, but the scope of the fund is limited to personal and mental injury.

Defective or dangerous?

The proposed new Product Liability Directive as well as the current Product Liability Directive⁹⁹ both centre around the notion of ‘defect’ or ‘defectiveness’: only when a defective product has caused damage, does the Directive applies.¹⁰⁰ Should this prerequisite also apply to the compensation fund designed here?

In order to establish whether a product – which includes software under the proposed new Product Liability Directive¹⁰¹ – is defective one needs to establish whether the product, the high-risk AI-system, does not provide the safety which the public is entitled to expect, taking all circumstances into account.¹⁰² These expectations might not only be difficult to establish, proving the defect can subsequently be even more challenging. So much so, that the European Commission has included

⁹⁶ Art. 4(6) proposed revision Product Liability Directive, COM(2022) 495 final.

⁹⁷ See on this topic for instance Richard Gaskins, *Accounting for Accidents: Social Costs of Personal Injuries*, 41 *VICTORIA U. WELLINGTON L. REV.* 37 (2010), p. 37-40.

⁹⁸ Personal injury caused by a high-risk AI-system needs to be reported under art. 62 of the proposed AI Act, as this would be a ‘serious incident’ (art. 3(44) AI Act).

⁹⁹ Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products.

¹⁰⁰ Art. 1 Product Liability Directive, art. 5 proposed revision Product Liability Directive.

¹⁰¹ Art. 4(1) proposed revision Product Liability Directive.

¹⁰² Art. 6(1) Product Liability Directive, art. 6(1) proposed revision Product Liability Directive.

rebuttable presumptions on the defectiveness of a product in its proposal for the revision of the product liability regime.¹⁰³

These difficulties could prove an important delaying factor in the payment of compensation from the fund. To ensure an efficient functioning of the fund and to ensure the (relatively) quick compensation of personal and mental injury suffered, it therefore seems best not to limit the fund to damage caused by *defective* high-risk AI-systems.

The same applies to the notion of dangerous products from the General Product Safety Directive.¹⁰⁴ This Directive states that a product is dangerous when it is not a safe product.¹⁰⁵ 'Safe product' is defined as:

'(...) any product which, under normal or reasonably foreseeable conditions of use including duration and, where applicable, putting into service, installation and maintenance requirements, does not present any risk or only the minimum risks compatible with the product's use, considered to be acceptable and consistent with a high level of protection for the safety and health of persons, taking into account the following points in particular: (...)'¹⁰⁶

Assessing what is 'normal', 'reasonably foreseeable', or 'acceptable and consistent' is going to be challenging and can thereby delay the process of compensating those suffering personal or mental injury. Therefore, the fund as explored here would not require the damaging high-risk AI-system to be deemed 'dangerous' within the meaning of the General Product Safety Directive.

This gives us a rough outline of the fund: it covers losses resulting from personal and mental injuries caused by a high-risk AI-system. The next step is to establish which parties should contribute to the fund.

Contributors to the fund

When it comes to designing a compensation fund for damage caused by AI systems, the contributors to the fund should have a position in which they benefit from the risks involved and in which they are able to (best) address potential risks just as with some of the compensation funds discussed above (IOPC, ACC).¹⁰⁷ As these contributors would be able to address the risk, they are likely to be in a position to exert some control over that risk. Consequently, they could reduce the risks involved. Therefore, putting the financial burden on the shoulders of these contributors seems logical – they are the ones that in the end are best able to keep the risks at bay and could be potentially receptive to this financial incentive to limit risk if possible. In addition, they might also benefit from the risks involved by developing and selling the high-risk AI-system for instance. So, these contributors could be those involved in developing the software, selling the high-risk AI-system, or the users of the AI-system. More importantly though, those parties responsible for ensuring the high-risk AI-system is in conformity with safety regulation will have considerable influence and control over the risks this AI-system might pose. Here again, we can link to the proposed AI Act and its terminology, as the

¹⁰³ Art. 9(1) proposed revision Product Liability Directive.

¹⁰⁴ Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety.

¹⁰⁵ Art. 2(c) General Product Safety Directive.

¹⁰⁶ Art. 2(b) General Product Safety Directive.

¹⁰⁷ See also European Commission, WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust, COM(2020) 65 final, p. 22, in relation to 'addressees of the legal requirements that would apply in relation to the high-risk AI applications'.

proposed Act states which parties are responsible for the conformity of AI-systems with the safety requirements for high-risk AI-systems that are laid down in the AI Act.

These parties are the providers of (high-risk) AI-systems. The European Commission has defined 'provider' in art. 3 of the proposed AI Act as follows:

“provider’ means a natural or legal person, public authority, agency or other body that develops an AI system or that has an AI system developed with a view to placing it on the market or putting it into service under its own name or trademark, whether for payment or free of charge.’

The proposed AI Act applies to these providers, irrespective of whether they are established within the European Union or elsewhere.¹⁰⁸ For a compensation fund, this would mean that providers who place their AI-systems on the market or put it into service under the provider’s name or trademark will have to contribute to the fund. Providers can offset their costs by charging higher prices for (the use of) their high-risk AI-systems. Thereby, users indirectly support the fund which is desirable as users too benefit from the use of the high-risk AI-system. This also means that those who produce and use more high-risk AI-systems will pay a higher share to the fund than those who produce and use fewer of these systems. The contributions paid therefore are linked to risks involved. In addition, this ties in with the community responsibility for damage caused by high-risk AI-systems. As accidents will happen and society as a whole benefits from high-risk AI-systems, it is justified to let society as a whole contribute to the fund for compensating the damage these systems cause.

Of course not all providers of high-risk AI-systems will be based in the EU. When a provider is based outside of the EU, the distributor of the high-risk AI-system should take care of the contribution to the fund instead of the provider. This, again, is linked to the proposed AI Act: it is the distributor¹⁰⁹ that has to ensure that the provider based outside of the EU has designed his high-risk AI-system in conformity with the AI Act. If this is not the case, the distributor should refrain from bringing the system onto the EU market.¹¹⁰ He has therefore also some control over the risks involved.

So, the designed compensation fund for damage (personal injury, mental injury) caused by high-risk AI-systems (as defined by the proposed AI Act) is contributed to by either the provider or the distributor of the system.

Who can claim from the fund?

This brings us to the question of whom can claim compensation from the fund. Of course, those who have suffered the personal injury or mental injury should be able to claim from the compensation fund designed here. But what happens when the personal injury has resulted in the death of the injured person?

As we have seen above, for example, the Schadfonds Geweldsmisdrijven is open to claims from loved ones and relatives of the deceased and some entitlements for spouses and children of the deceased arise from the ACC.¹¹¹ It seems reasonable to do the same for the compensation fund for damage caused by a high-risk AI-system. This requires an exhaustive list of the relatives and loved ones who have a claim under the compensation fund. Children and spouses and those to whose livelihood the deceased contributed will likely be on that list. The question whether the parents of

¹⁰⁸ Art. 1 AI Act. See also recital 53 and 54.

¹⁰⁹ Defined in art. 3(7) AI Act as ‘any natural or legal person in the supply chain, other than the provider or the importer, that makes an AI system available on the Union market without affecting its properties’.

¹¹⁰ Art. 27 AI Act.

¹¹¹ Art. 3 lid 1 sub c WSG; Section 63 ff ACC.

the deceased or other parties would have a claim needs further discussion and consideration. This goes beyond the scope of this contribution.

An assessment committee

Under the September 11th Victim Compensation Fund a Special Master decides on claims,¹¹² and under the Schadefonds Geweldsmisdrijven a committee is asked to decide on the claims for compensation.¹¹³ Where the Special Master is an individual,¹¹⁴ the Schadefonds Geweldsmisdrijven committee consists of a panel of either one individual (the so-called *enkelvoudige kamer*) or a panel of at least three individuals (*meervoudige kamer*) that decides on the claims.¹¹⁵ A compensation fund as designed here might face straight-forward claims for, for instance, personal injuries listed in the list of compensable injuries. For these claims, a panel of only one individual having to decide on the claim should be sufficient. However, in case of a more complex claim, having a panel of three individuals deciding on it seems a more diligent way to proceed.

4.3 The role of tort law

All of the above leaves us with an important question: what about tort law? In relation to damage caused by high-risk AI-systems, tort law does not become obsolete. Compensation for material damage, pure economic loss, would still be governed by tort law. This means that the Product Liability Directive and its proposed successor as well as the proposed AI Liability Act and national tort law will remain relevant in the context of AI. Only when it concerns personal injury and mental injury will the fund provide compensation. Besides, it could be considered to give the fund the opportunity to seek redress for the compensated damage. Tort law would be applicable to such a claim. This would also uphold the two main functions, compensation and prevention, of tort law

5. Concluding remarks

This contribution started with the question of whether a compensation fund could provide for a balance between compensation and innovation.

The compensation fund as designed in the previous section would cover losses from personal injury and mental injury caused by high-risk AI-systems. In the design, elements have been linked to proposed EU legislation, more specifically the AI Act. The scope of the compensation fund would be limited to losses resulting from personal injury and mental injury. The compensation of material losses, pure economic losses and damage to data is excluded from the fund, thereby not providing for a balance between innovation and compensation in relation to these types of damage.

However, in relation to losses from personal injury and mental injury, the compensation fund as designed here could strike such a balance. It could ensure full compensation and community responsibility for the damage suffered, avoiding an injured party to have to bear the development risk of a development that benefits society as a whole. This might also contribute to the acceptance of high-risk AI-systems, as well as provide providers and distributors of these systems with legal certainty on their liability risks. Whether, however, these effects will actually be achieved by the compensation fund as set out in this contribution requires more research. For instance, a law and economics study should map out which incentives the compensation fund provides and if this would

¹¹² Richard P. Campbell, *The September 11th Attack on America: Ground Zero in Tort and Insurance Law*, 9 CONN. Ins. L.J. 51 (2002), p. 59-60; Robert M. Ackerman, *The September 11th Victim Compensation Fund: An Effective Administrative Response to National Tragedy*, 10 HARV. NEGOT. L. REV. 135 (2005), p. 144.

¹¹³ Art. 8 WSG, see also <https://www.schadefonds.nl/schadefonds/wet-en-beleid/> [accessed 16 March 2023].

¹¹⁴ The current Special Master is Allison Turkel: www.justice.gov/opa/pr/justice-department-announces-allison-turkel-special-master-september-11th-victim-compensation [accessed 22 March 2023].

¹¹⁵ Art. 8 lid 2 WSG.

indeed be a way to encourage innovation. Any unintended effects of the fund – especially any potentially negative impact on prevention of damage (one of the main functions of tort law) – should be mapped out and the fund’s feasibility requires further study. This contribution is therefore merely a starting point for further research and discussion on this topic, it could be considered a first step in reaching that balance between ensuring compensation and encouraging innovation.