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Impact Assessment Study on Common Chargers of Portable Devices

Draft Final Report

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Contents

1 Introduction

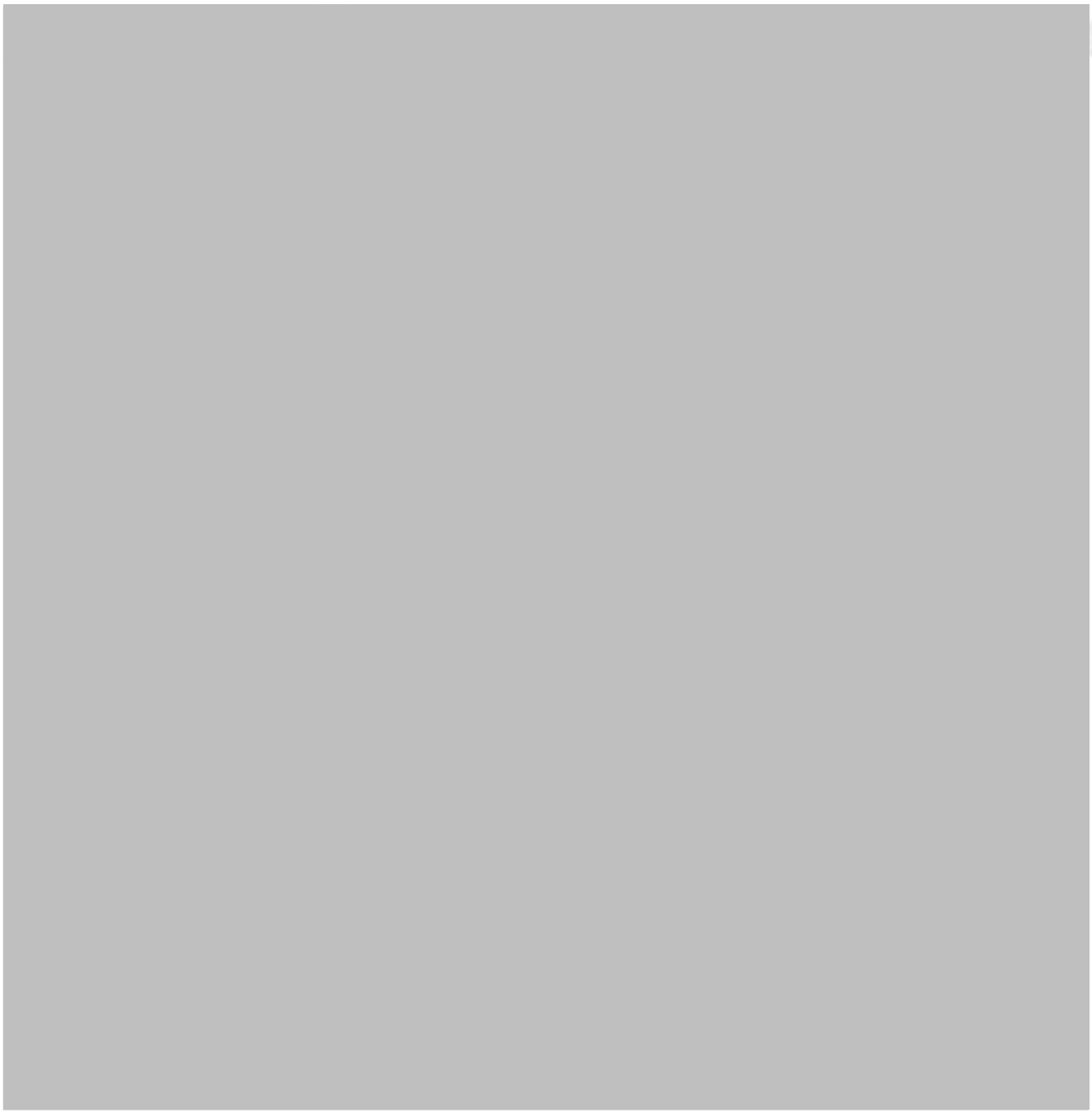
This draft final report is the **third deliverable** submitted to the European Commission by Ipsos, Trinomics and Fraunhofer FOKUS (on behalf of a consortium led by Economisti Associati) in the context of the Impact Assessment Study on the Common Chargers of Portable Devices.

The **aim of this study** is to provide input for the Commission impact assessment accompanying a new initiative to limit fragmentation of charging solutions for mobile phones and similar devices, while not hampering future technological evolution.

This report presents a draft version of all elements of the study, to be further refined, updated and, where necessary, completed following discussions with and comments from the Commission services. The submission of the **final report** is foreseen for mid-November 2019.

The report is structured as follows:

- **Chapter 2** provides a brief overview of the methodological approach to the study.
- **Chapter 3** contains a detailed discussion of the current situation regarding chargers for mobile phones, including an account of the main problems the initiative is intended to address.
- **Chapter 4** describes the baseline and the concrete policy options that have been shortlisted for in-depth assessment, following a discussion of a wider range of elements that were considered.
- **Chapter 5** contains the analysis of the likely social, environmental and economic impacts of the different options, as well as important considerations regarding the expected decoupling rates and other potential implementation issues.
- **Chapter 6** summarises the main likely impacts of all shortlisted policy options, and compares these to provide an aid to the political decision making process this study is intended to support.
- The **Annexes** contain supporting materials, including synopsis reports with the main results of the Commission's public consultation and the consumer panel survey carried out by Ipsos, as well as product fiches with additional market and technological data.



Annexes

Annex A: Glossary

Term	Definition
Alternating Current (AC)	AC is an electric current which periodically reverses direction, in contrast to direct current (DC) which flows only in one direction. Alternating current is the form in which electric power is delivered to businesses and residences, and it is the form of electrical energy that consumers typically use when they plug appliances into a wall socket.
Consumer panel	Group of individuals selected by a business or organization to provide input and opinion on products and services for research on consumer behaviour. Panel members are chosen to be representative of the general population or a target group.
Counterfeit charger	Counterfeit chargers (external power supplies and/or connector cables) are chargers infringing intellectual property right(s), such as trademark, patent and design. They have a reputation for being lower quality (e.g. they can damage batteries). They frequently do not fulfil safety requirements, thus posing risks to consumer safety (e.g. risk of causing electrocution, starting a fire).
Decoupling	Sale of mobile phones without including a charger
External Power Supply (EPS)	Device which meets all of the following criteria, as per Regulation 278/2009 on ecodesign: (a) it is designed to convert alternating current (AC) power input from the mains power source input into lower voltage direct current (DC) or AC output; (b) it is able to convert to only one DC or AC output voltage at a time; (c) it is intended to be used with a separate device that constitutes the primary load; (d) it is contained in a physical enclosure separate from the device that constitutes the primary load; (e) it is connected to the device that constitutes the primary load via a removable or hard-wired male/- female electrical connection, cable, cord or other wiring; (f) it has nameplate output power not exceeding 250 Watts; (g) it is intended for use with electrical and electronic household and office equipment as referred to in Article 2(1) of Regulation (EC) No 1275/2008.
High-end phones	Phones that are amongst the most expensive or advanced in a company's product range, or in the market as a whole.
In-the-box charger	Chargers that are sold together with the mobile phone, when consumers buy a new phone.
Lightning	Proprietary computer bus and power connector created by Apple Inc. It was introduced on September 2012 to replace its predecessor, the 30-pin dock connector. The Lightning connector is used to connect Apple mobile devices like iPhones, iPads, and iPods to host computers, external monitors, cameras, external power supplies, and other peripherals. Using 8 pins instead of 30, Lightning is significantly more compact than the 30-pin dock connector and can be inserted with either side facing up. However, unless used with an adapter, it is incompatible with cables and peripherals designed for its predecessor.
Low-end phones	Phones that are amongst the cheapest in a company's product range, or in the market as a whole.
Low Voltage Directive (LVD)	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment. The LVD focuses on health and safety risks, and applies to a wide range of equipment designed for use within certain voltage limits, including power supply units.
Memorandum of	Nonbinding agreement between two or more parties outlining the terms and details of an

Understanding (MoU)	understanding, including each parties' requirements and responsibilities. It expresses a convergence of will between the parties, indicating an intended common line of action.
Mobile phone	Battery-powered handheld communication device of which the primary purpose is voice telephony, which operates on public cellular networks, which potentially supports other services and which is designed to be hand-portable.
Radio Equipment Directive	The Radio Equipment Directive 2014/53/EU (RED) establishes a regulatory framework for placing radio equipment on the market. It ensures a Single Market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It also provides the basis for further regulation governing some additional aspects. These include technical features for the protection of privacy, personal data and against fraud. Furthermore, additional aspects cover interoperability, access to emergency services, and compliance regarding the combination of radio equipment and software.
PMA	Power Matters Alliance (PMA) was a global, not-for-profit, industry organization whose mission was to advance a suite of standards and protocols for wireless power transfer. The organization was merged with Alliance for Wireless Power (A4WP) in 2015 to form AirFuel Allliance.
Preferred Charging Rate	Concept introduced in the MoU signed in 2008. It was defined as charging a battery from 10% capacity to 90% capacity within a maximum of 6 hours.
Proprietary charging solution	Charging solution owned by a single organization or individual. Ownership by a single organization gives the owner the ability to place restrictions on the use of the solution and to change it unilaterally. Specifications for proprietary solutions may or may not be published, and implementations are not freely distributed.
Qi	Open interface standard that defines wireless power transfer using inductive charging over distances of up to 4 cm, and is developed by the Wireless Power Consortium. The system uses a charging pad and a compatible device, which is placed on top of the pad, charging via resonant inductive coupling. The Wireless Power Consortium (WPC) is a multinational technology consortium formed in December 2008. Its mission is to create and promote wide market adoption of its interface standard Qi. It is an open membership of Asian, European, and American companies, working toward the global standardization of wireless charging technology.
Quick Charge	Quick Charge is a Qualcomm's proprietary technology which allows for the charging of battery powered devices, primarily mobile phones, at levels above and beyond the typical 5 volts and 2 amps for which most USB standards allow. To take advantage of Qualcomm Quick Charge, both the external power supply and the device must support it.
Standalone charger	External power supplies sold on their own, without being part of a full package including a phone (or another device) and the charger
Universal Serial Bus (USB)	USB is an industry standard that establishes specifications for cables, connectors and protocols for connection, communication and power supply between personal computers and their peripheral devices, or between a device and the external power supply. Released in 1996, the USB standard is currently maintained by the USB Implementers Forum (USB IF).
USB-IF	The non-profit USB Implementers Forum, Inc. was formed to provide a support organization and forum for the advancement and adoption of USB technology as defined in the USB specifications. The USB-IF facilitates the development of high-quality compatible USB devices through its logo and compliance program, and promotes the benefits of USB and the quality of products that have passed compliance testing.
USB micro-B	Connector (B-Plug and B-Receptacle) which can be used for charging support and additional functions, whose reference specification is "Universal Serial Bus Cables and Connector Class Document" Revision 2.0 August 2007, by the USB Implementers Forum.

USB Type C	24-pin USB connector system, which is distinguished by its two-fold rotationally-symmetrical connector. A device with a Type-C connector does not necessarily implement USB 3.1, USB Power Delivery, or any Alternate Mode: The Type-C connector is common to several technologies while mandating only a few of them.
USB 3.1	USB 3.1, released in July 2013, is the successor standard that replaces the USB 3.0 standard. USB 3.1 preserves the existing SuperSpeed transfer rate, giving it the new label USB 3.1 Gen 1, while defining a new SuperSpeed+ transfer mode, called USB 3.1 Gen 2 which can transfer data at up to 10 Gbit/s over the existing USB-type-A and USB-C connectors (1250 MB/s, twice the rate of USB 3.0)
USB 3.2	USB 3.2, released in September 2017, replaces the USB 3.1 standard. It preserves existing USB 3.1 SuperSpeed and SuperSpeed+ data modes and introduces two new SuperSpeed+ transfer modes over the USB-C connector using two-lane operation, with data rates of 10 and 20 Gbit/s (1250 and 2500 MB/s).
USB Power Delivery	In July 2012, USB-IF announced the finalization of the USB Power Delivery (PD) specification (USB PD rev. 1), an extension that specifies using certified PD aware USB cables with standard USB Type-A and Type-B connectors to deliver increased power (more than 7.5 W) to devices with larger power demand. The USB Power Delivery specification revision 2.0 (USB PD rev. 2) was released as part of the USB 3.1 suite. It covers the Type-C cable and connector with four power/ground pairs and a separate configuration channel. Revision 3.0 was released in 2017.
USB Fast Chargers	Certified USB Fast Chargers support the Programmable Power Supply (PPS) feature of the USB Power Delivery 3.0 specification. New USB hosts, devices and chargers supporting PPS are required for users to take full advantage of this feature. Certified USB Fast Chargers are backwards compatible with devices that support USB Type-C™ and USB Power Delivery.
Wireless charging	Inductive charging (also known as wireless charging or cordless charging) a wireless charging that uses an electromagnetic field to transfer energy between two objects through electromagnetic induction. This is usually done with a charging station. Energy is sent through an inductive coupling to an electrical device, which can then use that energy to charge batteries or run the device.
30-pin connector	Apple's proprietary connector, common to most Apple mobile devices (iPhone (1st generation), iPhone 3G, iPhone 3GS, iPhone 4, iPhone 4S, 1st through 4th generation iPod Touch, iPad, iPad 2, and iPad 3) from its introduction with the 3rd generation iPod classic in 2003 until the Lightning connector was released in late 2012.