



Brussels, 23.3.2021
C(2021) 1876 final

<p>In the published version of this decision, some information has been omitted, pursuant to articles 30 and 31 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus [...]</p>		<p style="text-align: center;">PUBLIC VERSION</p> <p>This document is made available for information purposes only.</p>
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**Subject: State Aid SA.56606 (2020/N) – Austria
Austria joining the 2018 IPCEI Microelectronics**

Excellency,

1. PROCEDURE

- (1) On 9 June 2020 Austria pre-notified its intention to grant aid related to its joining to the Important Project of Common European Interest on Microelectronics (“2018 IPCEI Microelectronics”), already established and aided by Germany, France, Italy and the United Kingdom (hereinafter jointly referred to as “the initial Member States”¹). The State aid to be granted by the initial Member States was approved by Commission Decision in 2018²

¹ The United Kingdom was a Member State at the time of establishment and approval by the Commission of the 2018 IPCEI Microelectronics.

² SA.46578 (2018/N) – Germany, SA.46705 (2018/N) – France, SA.46595 (2018/N) – Italy, SA.46590 (2018/N) - United Kingdom, OJ C 7, 10.01.2020, p. 7. The authentic and non-confidential text of the decision, can be found at: <http://ec.europa.eu/competition/elojade/isef/index.cfm>.

Seiner Exzellenz Herrn Alexander Schallenberg
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(hereinafter referred to as the “2018 decision”). The pre-notification made reference to the overall descriptive texts of the 2018 IPCEI Microelectronics³ (in an Addendum to the so-called “Chapeau” (hereinafter referred to as “Addendum to the Chapeau”) and its annexes for Technology Fields 1 and 2 (hereinafter referred to as “TF 1” and “TF 2”). In addition, Austria pre-notified detailed information on the individual projects of three companies to join the 2018 IPCEI Microelectronics, consisting of their project portfolios and funding gap calculations. The initial Member States granting aid for the 2018 IPCEI Microelectronics submitted signed letters accepting Austria’s participation to the IPCEI.

- (2) Between June and December 2020, the Commission requested and received complementary information from the Austrian authorities and the companies involved.
- (3) The Austrian authorities notified the aid to the three Austrian companies joining the 2018 IPCEI Microelectronics on 22 December 2020, and complemented their notification by submissions of 7 January 2021, and, following additional requests for information, by submissions of 26 and 29 January, and 1, 9, 10, 15 and 23 February 2021.
- (4) The initial Member States confirmed on 7 January 2021 their agreement with Austria joining the 2018 IPCEI Microelectronics and, in particular, with the references in the notification to the Addendum to the Chapeau and to its annexes for TF 1 and TF 2.
- (5) The scope of the present decision is limited to the aid notified by Austria. No change is made in the aid authorised by the Commission in the 2018 decision, which falls outside of the scope of the present decision.
- (6) By a letter accompanying the notification, Austria agreed to waive its rights deriving from Article 342 of the Treaty of the Functioning of the European Union (“TFEU”) in conjunction with Article 3 of Regulation 1⁴ and agreed to have this Decision adopted and notified in English.

2. DESCRIPTION OF THE 2018 IPCEI MICROELECTRONICS

- (7) On 13 December 2018, the Commission adopted the 2018 decision by which it found compatible with the internal market, pursuant to Article 107(3)(b) TFEU, the aid measures notified by Germany, France, Italy and the United Kingdom for setting up the 2018 IPCEI Microelectronics. The 2018 IPCEI Microelectronics

³ The document referred to as “Chapeau” provides for the common overall description of the 2018 IPCEI Microelectronics; the “Addendum to the Chapeau” describes the contribution of the Austrian companies joining to the 2018 IPCEI Microelectronics. The Annexes to the Chapeau for Technology Field 1 (“TF1”) and Technology Field 2 (“TF2”) describe in further detail the overall structure of the works to be undertaken in R&D&I and first industrial deployment (“FID”) in the technology field, the direct partners (participating companies) that will join their efforts to address the important challenges in the relevant field, the work packages they will concentrate on, the collaborations, spillovers, etc. In the pre-notification, the Austrian authorities describe the Austrian companies’ contribution to those technology fields in more detail.

⁴ Council Regulation No 1 determining the languages to be used by the European Economic Community, OJ 17, 6.10.1958, p. 385.

involved, as direct partners, 27 companies – beneficiaries of aid from the four Member States – as well as two research organisations, and it provided for State aid of up to EUR 1.75 billion to those aid beneficiaries.

- (8) The 2018 IPCEI Microelectronics focuses on research and development and innovation (R&D&I) and relevant first industrial deployment (FID) with the aim of developing innovative microelectronics, technologies and components for Automotive, Internet of Things (IoT) and other key applications (such as space, avionics, and security) and to establish FID in those fields.⁵
- (9) It is organised along five technology fields (TFs), within which the participating undertakings conduct both R&D&I and FID activities:
- TF 1: Energy efficient chips;
 - TF 2: Power semiconductors;
 - TF 3: Sensors;
 - TF 4: Advanced optical equipment; and
 - TF 5: Compound materials.
- (10) The Commission found in its decision that the 2018 IPCEI Microelectronics fulfils all criteria of the IPCEI Communication⁶ and therefore authorised the aid on the basis of Article 107(3)(b) TFEU. In particular, the Commission found that the 2018 IPCEI Microelectronics is an integrated project designed to contribute to a common objective, to be reached by combining R&D&I and FID activities in the five technology fields. Its five TFs are the individual components of the IPCEI, which are interlinked and complementary as well as necessary for the achievement of the overall objectives of the 2018 IPCEI Microelectronics⁷. In order to ensure the coherent implementation of the 2018 IPCEI Microelectronics, the participating Member States established a common governance structure, under a Supervisory Board, which has the task to review the progress and the results of the project and propose changes if necessary⁸.
- (11) The Commission also concluded that the 2018 IPCEI Microelectronics would benefit the European economy or society via positive spillover effects in the form

⁵ In particular, the objectives are to develop innovative technology components for Automotive, IoT and other applications, to establish FID in those fields, to unlock the full technological and economic potential of microelectronics, and to transfer it to European downstream industries for new/improved applications and new R&D in those sectors.

⁶ Communication from the Commission: Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest, OJ C188, 20.06.2014, p. 4.

⁷ See recital (275) of the 2018 decision.

⁸ The Supervisory Board is composed of the Public Authorities Board (PAB), with representatives of the Member States participating in the IPCEI Microelectronics, a representative of the European Commission and the IPCEI Microelectronics Facilitation Group (FG). The FG is composed of representatives of the companies participating in the 2018 IPCEI Microelectronics, including the coordinators of the five technology fields, and amongst its tasks is to drive the overall progress of the technology fields on a non-confidential basis.

of dissemination of knowledge and results⁹, including spillover effects generated in FID¹⁰ and in downstream markets¹¹. The negative effects of the aid, in terms of distortion of competition and effect on trade between Member States were deemed to be limited.

3. AUSTRIAN PARTICIPATION IN 2018 IPCEI MICROELECTRONICS

3.1. Procedure followed by Austria for joining

- (12) In April 2019 Austria declared its interest to join the 2018 IPCEI Microelectronics. In May 2019 the Austrian authorities launched a call for Expressions of Interest among the members of the Austrian Federation of the Electrical and Electronics Industry and the stakeholders, and selected three Austrian companies which would meet the time scale and quality of the existing IPCEI with clear and detailed projects.
- (13) In June 2019, Austria presented the selected companies and the accession plans to the 2018 IPCEI Microelectronics supervisory board and in July 2019 those Austrian companies presented outlines of their project portfolios.
- (14) In April 2020, by a joint letter the initial Member States expressed their agreement to the Austrian participation in 2018 IPCEI Microelectronics.

3.2. Description of the Austrian companies

- (15) The three companies to join the 2018 IPCEI Microelectronics (referred to as “the Austrian partners joining”) are briefly described below:

1. AT&S Austria Technology and Systemtechnik AG (“AT&S”)

AT&S is a manufacturer of advanced printed circuit boards¹² and IC substrates. They are used in automotive applications (e.g. transmission control, camera and security systems etc.), in computing (processors, servers), in industrial electronics (process control, sensors, etc.), in mobile devices (smartphones, smart watches, tablets, notebooks, etc.) as well as in medical and health technologies (hearing aids, pacemakers etc.).

⁹ Including via technical conferences and publications, roadshows and workshops, dedicated 2018 IPCEI Microelectronics annual conferences and web site, dissemination within the European collaborative R&D&I ecosystem, wide and free dissemination of the results, which are not subject to registered and unregistered Intellectual Property (“IP”) in technical and scientific publications and theses, by exploiting the use of the 2018 IPCEI Microelectronics results outside the targeted sector, for instance by multi-project wafer (MPW) capability or free process design kit (PDK) access, through standardisation activities and via major European clusters in microelectronics.

¹⁰ For instance by multi project wafer (MPW) access within the FID phase for external research and industrial partners or by opening the access to IPCEI Microelectronics direct partners’ facilities which are flexible enough to host prototype in small series with dedicated processes.

¹¹ By enabling the customers and cooperation partners of the 2018 IPCEI direct participants to develop new product applications and designs and to acquire specific skills as well as know-how, which again can be used in cooperation with third parties.

¹² Printed circuit boards form the backbone of all electronic devices, as they enable the electrical and mechanical connection and interaction between all electronic components (e.g. semiconductors, resistors, capacitors) in an electronic system.

2. Infineon Technologies Austria AG (“IFAT”)

IFAT is a subsidiary of Infineon Technologies AG (which is already a direct participant in the 2018 IPCEI Microelectronics). It develops semiconductor and system solutions applicable in all business areas and more specifically automotive, industrial power control, power management and multimarket, as well as digital security solutions in the following main application domains: eco-friendly, connected and safe mobility, efficient generation, transmission and conversion of electrical energy and security in the connected world.

3. NXP Semiconductors Austria GmbH & Co KG (“NXP-A”)

NXP-A is a subsidiary of NXP Semiconductors N.V. and is its global competence center for secure contactless identification and communication technologies, developing new innovative solutions in the fields of hardware design, software development, product and test engineering, product management, marketing and application support. Its core competences are in developing secure and contactless semiconductor solutions; software/firmware, as well as systems and applications, security and certification, digitalization of credentials, risk engine and algorithm development, contactless systems and frontends, low power analog mixed signal IC design as well as smart packaging and system integration, product design and test engineering.

4. DESCRIPTION OF THE CONTRIBUTION OF THE AUSTRIAN COMPANIES TO 2018 IPCEI MICROELECTRONICS

4.1. Objectives of the Austrian companies for joining

(16) The Austrian authorities submit that the three companies joining aim to contribute to the 2018 IPCEI Microelectronics by expanding its geographic coverage and adding innovation competencies and capabilities, directly supporting its objectives. They will focus on TF 1 Energy efficient chips and TF 2 Power semiconductors, where they aim to create additional technological innovation in energy-efficient power semiconductors, advanced interconnection and organic packaging technology aspects. Those contributions will focus on the areas of security, energy efficiency, and integration and packaging technologies.

4.2. Strengthening the 2018 IPCEI Microelectronics and contribution to the achievement of its objectives

(17) The Austrian authorities affirm that by joining the 2018 IPCEI Microelectronics, the Austrian partners will contribute to its objectives (see recital (8) above) through the following main contributions, which are complementary with the activities of the 2018 IPCEI Microelectronics and add value beyond what it already covered:

1. Help create a new generation of highly secure ICs to enhance security at the IC and system level for energy efficient wireless systems;

2. Implement the next generation of packaging and critical OSAT¹³ technology;
 3. Achieve significant progress beyond the state-of-the-art for advanced new process technologies for power electronics based on both silicon substrates as well as on enhanced wide bandgap materials.
- (18) In TF1, the 2018 IPCEI Microelectronics partners jointly address the challenge of improving the energy efficiency of basic microelectronic components, or chips. Energy efficiency at the chip level needs to be viewed in conjunction with other requirements including security.
- (19) NXP-A will contribute to TF1 with improved hardware security and dependability on chip level in the context of the development and the deployment of new low/ultra-low power radiofrequency (RF) technologies. The objective of NXP-A is to contribute significantly to the creation of a silicon solution platform to achieve secure and reliable implementations of machine learning inference engines across current and future applications. NXP-A will contribute to achievement of the focus of TF1 in the deployment of the FDSOI¹⁴ technology as well as the development/deployment of new secure low-power technologies.
- (20) In TF2, the 2018 IPCEI Microelectronics partners jointly address the challenge of power semiconductor devices with increased energy efficiency and reliability.
- (21) Given the increased need for low-power systems – both at the application and microelectronic component/device levels – and the need for smaller size and highly integrated components, AT&S and IFAT aim in TF2 to address power semiconductors and integrated smart power solutions along the automotive and IoT value chains with a focus on chip technologies, assembly and integration techniques, manufacturing processes and reliability/quality improvements.
- (22) Table 1 presents an overview of the Austrian contribution to the 2018 IPCEI Microelectronics objectives in TF1 and TF2:

TF		2018 IPCEI Microelectronics alignment	Austrian companies' contribution
1	NXP-A	Energy efficient chips, security	Silicon security and testing platforms, with a focus on UWB based communication/ localization solutions and battery management systems
2	IFAT	Energy efficiency and miniaturisation	Power MOS technology for minimized energy waste

¹³ Outsourced semiconductor assembly and test.

¹⁴ Silicon on insulator (SOI) technology refers to the use of a layered silicon-insulator-silicon substrate in place of conventional bulk silicon substrates in semiconductor manufacturing. In fully depleted silicon on insulator (FDSOI) devices, the silicon surface layer is very thin so that the electrically-induced switching of electrons supports less interference resulting in higher switching speeds.

TF		2018 IPCEI Microelectronics alignment	Austrian companies' contribution
			Power SiC for highest power efficiency Power GaN for lowest weight and space
	IFAT	Energy efficiency in applications: energy conversion	Smart rectifier technology
	IFAT	Packaging	New packaging/surface protection processes for power devices and MEMS
	AT&S	Packaging	Novel die packaging concepts
	AT&S	Miniaturisation	New miniaturisation concepts
	AT&S	Miniaturisation: cooling	Heat dissipation
	IFAT	Enhanced reliability: packaging	MEMS
	IFAT	New digital features	New CD (CMOS-DMOS) technology

Table 1 – Overview of the Austrian companies' contribution to the TF1 and TF2 of the 2018 IPCEI Microelectronics

4.3. Contribution of the Austrian companies from the perspective of the integrated character of 2018 IPCEI Microelectronics

(23) The Austrian authorities submit that the projects of the three Austrian companies will be fully integrated with the existing 2018 IPCEI Microelectronics, being seamlessly inserted in the common 2018 IPCEI Microelectronics structure, its strategic programme and the common roadmap. The activities of the Austrian partners are designed to support the 2018 IPCEI Microelectronics objectives and aligned with its organization. The Austrian partners will collaborate with members of the 2018 IPCEI Microelectronics in various technology fields.

4.3.1. Description of the contribution of the Austrian companies' projects to the 2018 IPCEI Microelectronics

In TF1

(24) NXP-A will contribute to TF1¹⁵ – Energy efficient chips – with a project containing both R&D&I and FID, aimed at developing new hardware-based solutions for enhanced security and reliability of energy efficient future IC

¹⁵ Each TF is organised alongside different work packages (WPs). In particular, TF1 contains 6 WPs: WP1 - New ultralow power FDSOI technologies, WP2 - New ultra-low power RF technologies, WP3 – Embedded non-volatile memory, WP4 - Specific technologies, WP5 - Moving to FID, and WP6 – Dissemination.

platforms for secure access (ultra-wide band (UWB)), and battery management systems. UWB will add significant features on top of existing smart access applications, by providing peculiar ranging and localization functionality and thereby increasing the security and accuracy of such systems.

- (25) NXP-A will collaborate and contribute to the work in WPs 2, 4, 5 and 6 of TF1 with the following activities:
- In WP2 NXP-A will work on innovation step-ups in order to finally enable FID of Security ICs and Virtual Testing of wireless communications for secure and precise near-field positioning, in the field of automotive (Secure Car Access), and in mid-term, Industrial IoT;
 - In WP4 NXP-A will execute R&D&I activities for next-generation tailored European technology solutions for fields such as IoT, Artificial Intelligence or space applications;
 - In WP5 NXP-A will address all the activities needed in a first industrial deployment phase;
 - In WP6 NXP-A will use its connections within the European innovation ecosystem for the IPCEI to actively discuss project results and directions with stakeholders.

In TF2

- (26) AT&S will contribute to TF 2¹⁶ – Power semiconductors – with a project containing R&D&I and FID, focusing on implementing the next generation of packaging and critical OSAT technology, and in particular for process technology in the competence of Main Board/High Density Interconnects and Substrate Technology, including functional cores (magnetic cores, active cores). Those technologies are applied for electrical connection, heterogeneous integration and housing of all advanced silicon based electrical components (e.g. processors, converters) and form the base for the new System in Package (SiP) technologies. The technologies and solutions aimed at by AT&S will reduce power and energy demand and subsequently have a positive impact on climate change.
- (27) AT&S will collaborate and contribute to the work in WP1, WP2, WP3 and WP4 of TF2 with the following activities:
- New miniaturization concepts resulting in shorter interconnects; novel patterning and structuring technologies resulting in better signal performance; signal stabilization and improved power delivery by integrated inductors;
 - Solutions for heat dissipation and double-sided cooling in core;
 - Competence of manufacturing on large production format up to 21x24 inch, including the use of organic material, ensuring sustainable manufacturing by

¹⁶ TF2 contains 5 WPs: WP1 - New smart power and power discrete technologies, WP2 - New high voltage technologies for power integrated circuits, WP3 - New assembly techniques, WP4 - Concepts according to Industry 4.0 and WP5 - Improved and assured quality and reliability

reduced consumption of resources (water, energy) on single product level and competitiveness by economy of scales;

- Competence and experience in holistic design and development of forming interconnection between single components;
 - Automation concepts in assembly and packaging, full traceability concepts (new in assembly and packaging).
- (28) IFAT will contribute to TF2 – Power semiconductors – with a project comprising R&D&I and FID aimed at process technology generations in power electronics for both classical silicon substrates as well as for enhanced wide bandgap materials, including the most recent power MOS technology with benchmark on resistance. Its project also includes new SiC HV technology, new Gallium Nitride (GaN) medium and high voltage power semiconductor technologies, smart rectifier technology, new glass-based processes for MEMS packaging, and CD (CMOS-DMOS¹⁷) technologies with enhanced logic functionality.
- (29) IFAT will collaborate and contribute to all five WPs of TF2 with activities on the following tasks:
- Silicon-based 60V power MOS technology with benchmark on-resistance, innovating major power application domains by making those applications more energy-efficient,
 - compound material-based Silicon carbide (SiC) high voltage technology leading to a demonstrator product for a new family of SiC devices. As a result, power applications will become more energy efficient,
 - compound material-based GaN medium and high voltage technologies with enhanced reliability and device characteristics. The benefit for the user is higher energy-efficiency and significantly reduced weight for power applications,
 - New Silicon-based Smart rectifiers to boost energy efficiency in alternator applications for mobility. The goal is reduced CO2 emission in cars,
 - New surface protection processes for power devices and MEMS as enablers for reliability in mobility applications. Advanced A&P technologies will lead to smaller and more robust applications,
 - Silicon-based CD-technologies with enhanced logic functionality and [...] (*) to enable digitalization in mobility applications. This leads to innovative mobility applications adopting IoT approaches.

4.3.2. *Complementarity of the Austrian companies' projects to the 2018 IPCEI Microelectronics*

- (30) In addition to contributing to the achievement of 2018 IPCEI Microelectronics' objectives, as described in section 4.2, the Austrian authorities submit that the

¹⁷ CD – Critical Dimension; CMOS - Complementary Metal Oxide Semiconductor; DMOS - Double-diffused Metal Oxide Semiconductor

three Austrian companies joining in TF1 and TF2 will contribute to the integrated nature of the 2018 IPCEI Microelectronics also by adding at least 26 IPCEI-induced or -enhanced collaborations with direct partners within the respective TF and across the TFs, which in turn also will contribute to the achievement of the objectives of the respective TFs and of the IPCEI overall.

- (31) For TF1, the contribution of NXP-A to energy-efficient security components for UWB is clearly aligned with the overall TF1 objectives of energy-efficient chips. Security aspects require close interaction with technology providers at the hardware level and system manufacturers on the application side. To that end, NXP-A will enhance the collaborations with partners in TF1, but also with TF2 and TF3 (e.g. partner IFAT for TF2 and Bosch for TF3). It thus addresses both up- and downstream partners in the IoT and automotive value chains, e.g. regarding proper coverage of functional and non-functional requirements and optimized design-production interfaces. That collaboration implies tighter collaboration in TF1 and integration across the TFs, with emphasis on TFs 1-3. The precise focus of NXP-A on security for UWB and battery management will not impair the existing complementarity and necessity of the technology fields of the 2018 IPCEI Microelectronics.
- (32) Similarly, IFAT and AT&S will provide important contributions to the objectives of TF2 in the area of power semiconductors that facilitate tighter integration of 2018 IPCEI Microelectronics. There will be a tight collaboration with several TF2 partners for the targeted new generations of advanced power semiconductor technologies. As examples, IFAT will work with Bosch, STM and CEA-Leti on requirements for low resistivity 300 mm Power Silicon raw wafers to enable innovation for future Silicon 300mm power semiconductor based raw wafer engineering. There will be interaction of the Austrian partners with TF1, for example through the power aspects of the energy-efficient chips addressed there. Within the 2018 IPCEI Microelectronics, there are further mutual synergies with work on TF3, for example relating to issues of sensor integration and advanced packaging which will be addressed by the Austrian partners in TF2. There are synergies as well with TF5 on compound semiconductors through the processes for GaN and for SiC. In addition, IFAT's IPCEI-induced collaboration with OSRAM in power management for optical systems will contribute to the goals of WP2 and WP5 in TF2. Beyond TF2, the latter collaboration also supports WP4 of TF5 and so further strengthens the integration of the 2018 IPCEI Microelectronics.
- (33) Figure 1 visualizes the strengthening of the integration of the 2018 IPCEI Microelectronic through the new collaborations added by the Austrian participants.

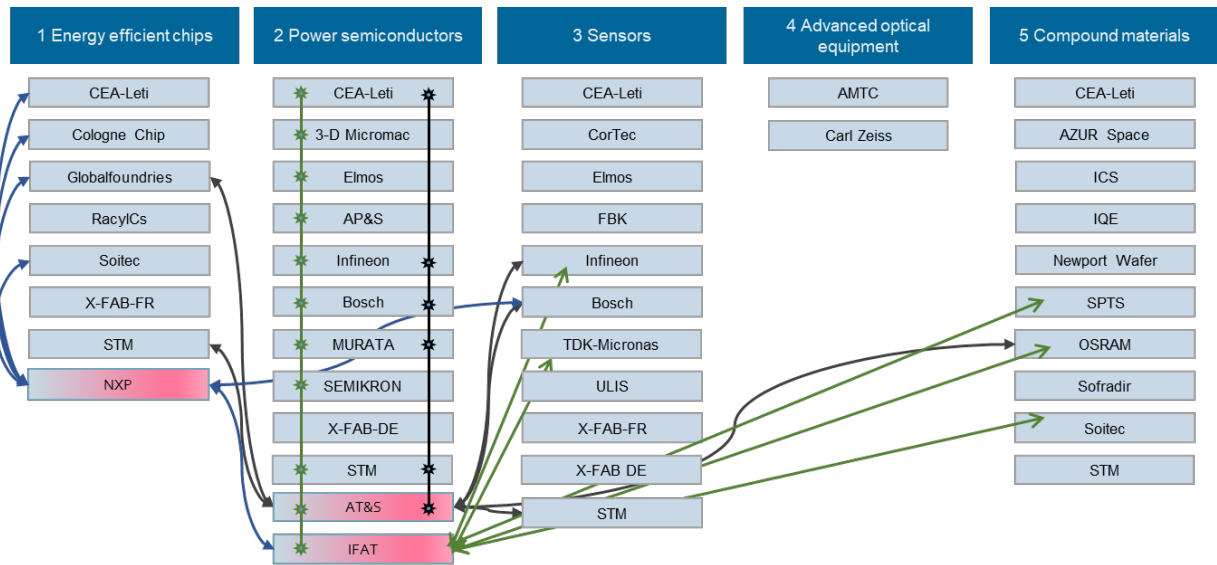


Figure 1 Strengthening of the integration of the 2018 IPCEI Microelectronics through new collaborations added by the Austrian companies across the TFs (only collaborations with direct partners are shown).

4.3.3. Austrian companies' contribution to the governance structure of 2018 IPCEI Microelectronics

- (34) The Austrian authorities submit that the Austrian companies will be fully integrated with the overall organisational structure, contribute to the corresponding bodies, and participate in the events as agreed within the 2018 IPCEI Microelectronics.
- (35) In particular, Austrian participants will be nominated to join the relevant IPCEI bodies in the Supervisory Board (a representative of the Austrian authorities will represent Austria in the Public Authorities Board; the ATS R&D director has been nominated to represent Austrian companies in the Facilitation group).
- (36) The Austrian authorities affirm that the Austrian companies are committed to participating in the governance structure of the 2018 IPCEI Microelectronics and to playing an active role in its bodies, including in the planning and organisation of joint activities, such as events and other spill-over activities.

4.4. Positive spillover effects generated by the Austrian companies' participation in 2018 IPCEI Microelectronics

- (37) The Austrian authorities submit that increased spillover effects associated with the Austrian participation will arise, compared to those committed under the 2018 IPCEI Microelectronics. In particular, new spillovers both from the R&D&I and FID activities of the Austrian companies will be generated. In general, they consist in dissemination of new knowledge, new networking and collaboration opportunities well beyond the partners of 2018 IPCEI Microelectronics.
- (38) That dissemination will be made through:
 - a. dissemination and spillover of knowledge that is not protected by IP rights;
 - b. dissemination and spillover of IP-protected results;

- c. dissemination and spillover during the FID; and
- d. dissemination and spillover in downstream markets and outside the targeted sector.
- (39) Each Austrian company has committed to participate in and contribute to the activities for dissemination of non-IP protected results, as organised by the 2018 IPCEI Microelectronics. In addition, they will disseminate the non-IP-protected knowledge generated through their IPCEI Microelectronics projects in conferences, workshops, distributing online content, supporting university and PhD students, etc. Such dissemination will be carried out also through participation in the European collaborative R&D&I system in new R&D&I projects.
- (40) Additional ways of dissemination to be carried out by the Austrian companies will be through standardisation activities and participation in major European clusters in microelectronics.
- (41) For the dissemination of the IP-protected results, the Austrian companies have committed to carry it out in different ways, including through collaborations with up- and downstream value chain partners and other undertakings and research organisations, workshops, roadshows, start-ups and SMEs coaching, etc. As a matter of principle, however, all Austrian companies will apply fair, reasonable, and non-discriminatory terms ("FRAND") when they license their results through no-exclusive licensing agreements.
- (42) The Austrian companies will use several ways for disseminating the results during FID. They will include, amongst others:
- providing access of leading-edge technologies to research organisations (ROs),
 - providing testing companies with new developed test concepts for analogue virtual testing (AVT),
 - providing SMEs with early access to new technologies developed under the IPCEI,
 - holding technology forums and prototyping workshops,
 - providing IPCEI-related application-oriented hardware/software (HW/SW) kits,
 - online simulation tools and open access to design-infrastructure (multi-project wafer (MPW)),
 - power electronics-oriented reference solutions workshops,
 - thermomechanical optimization of electronic control unit (ECU) design workshops,
 - reliability aspects of future power electronics ECU's workshops.
- (43) The Austrian companies have also committed to undertake spillover activities which aim at exploiting the use of the IPCEI results outside the targeted sector. The commitments encompass, for instance, conferences, networking and workshops to address new applications, such as energy transition or health, potential deployment of miniaturization and thermal management technologies

developed in the IPCEI for medical, biological testing and measuring applications, methods developed for re-using copper, potential deployment of miniaturization and thermal management technologies developed in the IPCEI for medical, biological testing and measuring applications, and workshops on IPCEI-induced best practices on digitalization and environmental protection.

(44) In addition, the Austrian authorities submit that the Austrian partners will collaborate with numerous research organisations and undertakings (both large companies and SMEs) that do not directly participate in 2018 IPCEI Microelectronics, in various R&D&I activities within the microelectronics eco system. They would include as minimum (based on a non-exhaustive selection) 63 collaborative relations with associated partners on collaborative research, alongside the supply chain and in the application domains.

(45) Table 2 presents an overview of the committed spillovers by each company:

Spill-overs	NXP-A spill-overs committed due to joining 2018 IPCEI	AT&S spill-overs committed due to joining 2018 IPCEI	IFAT spill-overs committed due to joining 2018 IPCEI
1. Dissemination and spill-over events	<ul style="list-style-type: none"> Contributions at conferences: <i>3-4/year</i> Workshops (e.g. with Silicon Alps, aligned with AT partners): <i>1/year</i> Media activities: <i>3/year</i> Spill-over activities with Universities (e.g. LTU programme): <i>1 event/year</i> 	<ul style="list-style-type: none"> Conferences (papers and presentation included) <i>5/year</i> Workshops (e.g. Technology Forum) <i>4/IPCEI Microelectronics</i> Online presence, <i>2/year</i> Financed University Chair: <i>1/IPCEI Microelectronics</i> Sponsorship for PhD students and PhD and/or master thesis: <i>8/year</i> 	<ul style="list-style-type: none"> Conferences: <i>5/year</i> Workshops: <i>5/year</i> Online presence : <i>3/year</i> Financed University Professorship: <i>+1</i> iHub Concept Implementation: <i>reaching out to 20.000 students /year</i> Infineon Ambassadors and Lectures Network: <i>15 lectures/year</i> Sponsorship for PhD students and PhD Excellence Program: <i>+50</i> Technical Study and Work Scholarship: <i>20 internships per year</i> Summer School: <i>100/year participants</i> Girls Days “Girls for Power” (<i>aims at raising awareness, in particular amongst women, of innovations in power electronics</i>)
2. Dissemination to the European collaborative R&D&I ecosystem	<ul style="list-style-type: none"> Participate and initiate in new R&D&I projects in the context of IPCEI activities: <i>2-3 proposals/year</i> 	<ul style="list-style-type: none"> New R&D&I projects that are contingent on the IPCEI: <i>1/IPCEI Microelectronics</i> 	<ul style="list-style-type: none"> New R&D&I projects that are contingent on the IPCEI: <i>1/year initiated by IFAT</i>
3. Dissemination of IP unprotected and protected results	<ul style="list-style-type: none"> See 1) above. Collaborations with Up- and downstream value chain players such as system integrators, Including SMEs or start-ups: <i>2 workshops,</i> i.e. Workshop NXP-A Connects/ NXP Tech 	<ul style="list-style-type: none"> Collaborations with LE, SMEs, RTOs, start-up: <i>15/year</i> 	<ul style="list-style-type: none"> Start-up and SME Entrepreneur Coaching: <i>2 IPCEI-specific calls</i> Collaborations with LE, SMEs, RTOs, start-up: <i>15/year</i> Roadshows and workshops: <i>3/year</i>

Spill-overs	NXP-A spill-overs committed due to joining 2018 IPCEI	AT&S spill-overs committed due to joining 2018 IPCEI	IFAT spill-overs committed due to joining 2018 IPCEI
	Days		
4. Dissemination by exploiting the use of the IPCEI results outside the targeted sector	<ul style="list-style-type: none"> Conferences and networking activities to address new applications, i.e. energy transition or health: <i>3 in total</i> 	<ul style="list-style-type: none"> Methods developed for re-using copper at least 1 workshop/IPCEI ME Potential deployment of miniaturization and thermal management technologies developed in this Project for medical, biological testing and measuring applications: <i>at least 1 workshop/IPCEI Microelectronics</i> 	<ul style="list-style-type: none"> IPCEI induced best practice workshops: Digitalization: up to 2 Environmental protection: up to 2 <i>Energy efficient power electronic: up to 2</i>
5. Dissemination through standardisation activities	<ul style="list-style-type: none"> Standardization activities: NXP-A will jointly work on UWB implementations through the standardization forums Car Connectivity Consortium (CCC), Fira Consortium, and IEEE to enable a global standard for hands-free smart access and other automotive localization use cases based on UWB. 	<ul style="list-style-type: none"> Standardization activities Stakeholders at EU level; Industrial Associations, Chambers of Commerce: <i>at least 2/IPCEI Microelectronics</i> 	<ul style="list-style-type: none"> Standardization activities Stakeholders at EU level; Industrial Associations, Chambers of Commerce <i>up to 5/year</i>
6. Dissemination via major European clusters in microelectronics	<ul style="list-style-type: none"> Workshops (e.g. with Silicon Alps Cluster and other cluster organizations in AT and Europe), see 1 Participation in European research projects, see 2) 	<ul style="list-style-type: none"> Microelectronic Clusters 	<ul style="list-style-type: none"> Microelectronic clusters: Austrian Green Tech Cluster <i>+3 joint events</i>
7. Spill-over effects in first industrial deployment	<p>See also 8)</p> <ul style="list-style-type: none"> Addressing SMEs to get early access to new technologies developed in IPCEI with high security and reliability approved with underlying standards, see 3): <i>3 in total.</i> Providing access of leading-edge technologies to ROs to gain first market experiences and improve user acceptance: <i>2 in total</i> New developed test 	<ul style="list-style-type: none"> AT&S Technology Forum: <i>1/IPCEI Microelectronics</i> AT&S IPCEI Prototyping Workshop: <i>2/IPCEI Microelectronics</i> Methods developed for re-using copper Potential deployment of miniaturization and thermal management technologies developed in this Project for medical, biological testing and measuring 	<ul style="list-style-type: none"> Provide and support IPCEI-related application oriented HW/SW kits: <i>up to 1500</i> Online Simulation tools: <i>5 online training courses /year</i> Open access to design-infrastructure (MPW): <i>(MPW) run(s) providing up to 200 wafers</i> (Power electronics oriented) Reference solutions workshops:<i>3/year(9 in total)</i> Thermomechanical optimization of ECU design workshops: <i>2/year</i>

Spill-overs	NXP-A spill-overs committed due to joining 2018 IPCEI	AT&S spill-overs committed due to joining 2018 IPCEI	IFAT spill-overs committed due to joining 2018 IPCEI
	concepts for AVT can be provided to testing companies: <i>2 in total</i>	applications: <i>at least 1 project</i>	<i>(6 in total)</i> <ul style="list-style-type: none"> Reliability aspects of future power electronics ECU's: <i>2/year (6 in total)</i> <i>All three types of workshops above – in alternating Eastern and Central Europe with focus on Slovakia Croatia, Bulgaria, Slovenia, Hungary, Romania, Portugal, Spain, targeting SMEs, startups (>65% SMEs as target), large undertakings and ROs</i>
8. Spill-over effects in downstream markets	<ul style="list-style-type: none"> Conferences and Workshops will address system integrators, Including SMEs or startups (i.e. Workshop NXP Connects/ NXP Tech Days, see 3) Media activities 	<ul style="list-style-type: none"> New R&D&I projects that are contingent on the IPCEI: <i>at least 1 project</i> 	<ul style="list-style-type: none"> New R&D&I projects that are contingent on the IPCEI <i>2 new applications</i>

Table 2: Spillovers committed by NXP-A, AT&S and IFAT

4.5. Added value from the Austrian participation in the 2018 IPCEI Microelectronics

(46) The Austrian authorities submit that joining of the Austrian companies adds value to 2018 IPCEI Microelectronics in several ways:

1. *By reinforcing the objectives of 2018 IPCEI Microelectronics with contributions in areas not yet fully addressed by the initial direct participants:* It includes secure microelectronics (NXP-A), packaging technologies (AT&S), and new materials FID (IFAT);
2. *By reinforcing the key areas (products/technologies) of strategic importance addressed in the 2018 IPCEI Microelectronics [TF1 and TF2] of energy efficiency and new materials and semiconductor technologies:* All three Austrian companies reinforce the efforts on energy-efficiency with different contributions at project level. Thus, NXP-A covers energy-efficiency but addressing security and UWB access systems not yet covered in the 2018 IPCEI. IFAT and AT&S align TF2 objectives of power electronics for reduced-energy consumption and important sub-objectives such as fewer energy losses and advance application and market requirements.
3. *By adding to the progress beyond state-of-the-art and benefits for the micro-/nanoelectronics ecosystem:* All three Austrian partners will expand the current state-of-the-art based on their R&D&I activities. Notable examples include the use of artificial intelligence in the case of NXP-A for novel security concepts, the use of Deep-UV lithography for nano-scale devices in the case of IFAT, and the work on novel packaging technologies for heterogeneous integration in the case of AT&S.

4. *By transferring RDI results into FID in adding more [technology] areas:* All three Austrian companies contribute test boards or demonstrators that provide clear access points for partners in the corresponding value chains with an emphasis on downstream markets. For example, IFAT's work will open the door to novel safety-critical applications with its targeted advancements in application-driven reliability and quality. Innovative failure analysis and material characterization in the critically important areas of SiC and GaN transistor technologies will thus open those new areas.
5. *By adding new IPCEI-induced collaborations and strengthening existing collaborations:* The participation of AT&S, IFAT, and NXP-A in the 2018 IPCEI Microelectronics will create new collaborations and reinforce existing ones. The Austrian partners will cooperate with the 2018 IPCEI Microelectronic partners in R&D&I projects, and through improved alignment in the value-creation chain.
6. *By enlarging the positive spillovers committed to by 2018 IPCEI Microelectronics:* Jointly, the three Austrian companies will expand and reinforce spill-over effects of the 2018 IPCEI Microelectronics and, additionally create new spill-overs. Those effects will address academic, technical, industry and SME audiences and will reinforce European skills for the European microelectronics ecosystem, and will include skillsets from IPCEI-induced activities not yet addressed in the 2018 IPCEI Microelectronics. Examples include IPCEI-induced advances in packaging, methods for re-using copper and new thermal management technologies for medical or biological testing (work of AT&S, TF2); UWB-based security concepts of NXP-A; Industry 4.0 for microelectronics manufacturing, demonstrators and management methods for critical material are examples of IFAT spill-overs from IPCEI-induced work in TF2.

5. DESCRIPTION OF THE STATE AID MEASURES NOTIFIED BY AUSTRIA

5.1. Eligible costs and aid amounts per aid beneficiary

- (47) The Austrian authorities have notified the aid to the three Austrian companies' projects in relation to their joining to the 2018 IPCEI Microelectronics. The Austrian authorities indicate that the activities performed during their projects qualify as R&D&I and FID in the meaning of points 21 and 22 of the IPCEI Communication. They submit that the total eligible costs¹⁸ of the three Austrian companies joining 2018 IPCEI Microelectronics are approximately EUR 280 million, out of which approximately EUR 208 million for FID and approximately EUR 72 million for R&D&I.

¹⁸ Eligible costs are only those costs of the individual projects, which comply with the requirements of the Annex to the IPCEI Communication. They, however, do not represent all costs required to conduct the R&D&I and FID activities concerned. The remaining portion of the costs required to conduct those activities, which are not considered eligible for public financing, will be absorbed by the companies.

- (48) Austria submitted the amounts of State aid under the measure that will be provided to the beneficiaries, together with the individual eligible costs and funding gaps¹⁹:

	Eligible costs			Funding gap (NPV)	Nominal State aid amount
	R&D	FID	Total		
NXP-A	[1 000 – 10 000]	[1 000 – 10 000]	[1 000 – 10 000]	- [1 000 – 10 000]	2 764
AT&S	[20 000 – 30 000]	[60 000 – 70 000]	[90 000 – 100 000]	- [20 000 – 30 000]	28 501
IFAT	[30 000 – 40 000]	[100 000 – 200 000]	[100 000 – 200 000]	- [80 000 – 90 000]	115 178
Sum	72 044	208 176	280 220	- 111 932	146 444

Table 3 – Eligible costs, Funding gap and nominal State aid amount, in thousand EUR

- (49) The Austrian authorities submit that the duration of the individual projects of the participating companies differ. The funding period (i.e. the period during which the costs that the companies can claim to be eligible should be incurred – between the start of the works on their individual projects and the expected end of each company’s FID, in line with the notification of the Austrian authorities) is the following:

	Date of the aid application	Starting date ²⁰	End date ²¹
NXP-A	13.07.2019	01.10.2019	2023
AT&S	16.07.2019	16.07.2019	2022
IFAT	16.07.2019	01.09.2019	2024

Table 4 - Dates of aid application, start of the works, end of FID

- (50) The Austrian authorities submit that the date of granting the aid is planned for March 2021 (depending on the Commission approval decision); the aid will be paid in instalments to be fixed in the individual funding contracts.

5.2. The aid instrument

- (51) The aid to be granted by Austria will take the form of direct grants.

¹⁹ The amounts shown under the funding gap column are expressed in net present value terms ("NPV") while the amounts in all other columns are expressed in nominal terms.

²⁰ The aid applications precede the starts of the works and the funding period begins with the start of the works. The companies have already started, at their own risk, their works in 2019.

²¹ The last eligible year during the FID phase.

5.3. Granting of the aid under the notified measures

- (52) The aid granting authorities will be the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and the Federal Ministry for Digital and Economic Affairs. The Austrian authorities have subjected the effective implementation of State aid to the prior approval of the Commission.
- (53) The Austrian authorities have committed to suspend the award and/or payment of the notified aid if the beneficiary still has at its disposal earlier unlawful aid that was declared incompatible by a Commission Decision (either as individual aid or aid under an aid scheme being declared incompatible), until that beneficiary has reimbursed or paid into a blocked account the total amount of unlawful and incompatible aid and the corresponding recovery interest.
- (54) The Austrian authorities have further confirmed that the aid beneficiaries fulfil the requirements of point 10 of the IPCEI communication, i.e. they are not undertakings in difficulty (let.a), that none is subject to outstanding recovery order (let.b), and that the aid granted is not subject to the conditions listed in point 10 (let.c) if the IPCEI Communication.
- (55) Finally, the Austrian authorities indicated that cumulation with other aid, *de minimis* aid, or Union funding will be allowed to cover the same eligible costs, only to the extent that the total funding does not exceed the notified and approved aid amount under this decision.

5.4. Transparency

- (56) The Austrian authorities have committed in the notification to respect the transparency and publication requirements of points 45 and 46 of the IPCEI Communication.

5.5. Reporting

- (57) The Austrian authorities have committed in the notification to respect the reporting obligation according to the requirement of point 49 of the IPCEI Communication and to follow the reporting obligation as set by the Commission decision for 2018 IPCEI Microelectronics.

6. ASSESSMENT OF THE MEASURES

6.1. Presence of State aid pursuant to Article 107(1) TFEU

- (58) According to Article 107(1) TFEU, "any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market".
- (59) In order to qualify as State aid under Article 107(1) TFEU, the following cumulative conditions must be met: (i) the measure must be imputable to the State and financed through State resources; (ii) it must confer an advantage on its recipient; (iii) that advantage must be selective; and (iv) the measure must

distort or threaten to distort competition and affect trade between Member States.

- (60) The public support measure of Austria will be financed with funds stemming from the State budget (see recital (52) above). The measure therefore involves State resources and is imputable to the State.
- (61) The aid measure in the form of direct grants granted to the participating companies will relieve them from costs that they under normal market conditions would have had to bear themselves. By contributing to the financing of their R&D&I and FID activities, the aid measures confer on the aid beneficiaries an economic advantage over their competitors. Those measures are granted only to the three aid beneficiaries listed in section 3.2 and the funding is not available to all undertakings in a comparable situation. The aid measures are therefore selective.
- (62) The aid beneficiaries involved in the relevant TF described in section 4.3.1, operate in different sectors along the microelectronics value chain. They are economic sectors open to intra-Union trade (both in terms of supply and demand). Therefore, the measures affect trade between Member States.
- (63) By reinforcing the aid beneficiaries' position in their respective sectors, which are open for competition, the measures are therefore liable to distort competition between undertakings active in those sectors.
- (64) In the light of the foregoing, the Commission considers that the public resources granted to the aid beneficiaries in the form of direct grants for the R&D&I and FID activities as described qualify as State aid within the meaning of Article 107(1) TFEU.

6.2. Legality of the aid measures

- (65) By notifying the measures before putting them into effect, the Austrian authorities have fulfilled their obligations under Article 108(3) TFEU.

6.3. Assessment of the aid measures

6.3.1. Applicable legal basis for assessment

- (66) In derogation from the general prohibition of State aid laid down in Article 107(1) TFEU, aid may be declared compatible by the Commission if it can benefit from one of the derogations foreseen in Article 107(2) and (3) TFEU.
- (67) According to Article 107(3)(b) TFEU, aid to promote the execution of an important project of common European interest may be considered to be compatible with the internal market.
- (68) In the IPCEI Communication, the Commission has provided criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest. The criteria set out in the IPCEI Communication are applicable to this case.
- (69) Article 107(3)(b) TFEU allows the Commission to consider as compatible with the internal market aid to promote the execution of an important project of

common European interest. The aid beneficiaries are joining with their individual projects an already established IPCEI, for which the Commission has confirmed by a decision that it meets the general eligibility criteria. Therefore, it is appropriate to consider first if the joining of the aid beneficiaries to 2018 IPCEI Microelectronics will contribute to its already established compliance with those general eligibility criteria. The Commission will assess that issue in section 6.3.2. Second, it needs to be considered whether the criteria for declaring the aid compatible with the internal market are met. The compatibility criteria are assessed in section 6.3.3.

6.3.2. Eligibility criteria

- (70) In order to be eligible for aid under Article 107(3)(b) TFEU, the notified measures must involve a project. That project must be of common European interest, and it must be important. In the present case, as the Austrian measures refer to public support for companies that intend to join an already established IPCEI, for which the compliance with those criteria has been already established by decision of the Commission, it is necessary to assess whether the joining of the three Austrian companies has an impact on the compliance of 2018 IPCEI Microelectronics with those three eligibility criteria.

6.3.2.1. Definition of an “integrated project”

- (71) According to point 13 of the IPCEI Communication, the Commission may consider eligible an "integrated project", that is to say, a group of single projects inserted in a common structure, roadmap or programme aiming at the same objective and based on a coherent systemic approach. The individual components of the integrated project may relate to separate levels of the supply chain but must be complementary and necessary for the achievement of the important European objective.
- (72) The Austrian authorities, as explained in sections 4.1, 4.2 and 4.3, consider that joining of the three Austrian companies will contribute to the integrated nature of the 2018 IPCEI Microelectronics. The Commission shares that analysis for the following reasons.
- (73) The Commission recalls that the integrated 2018 IPCEI Microelectronics is designed in such a way as to contribute to a common objective, formulated by the initial Member States and participating companies (see section 2). The objective of 2018 IPCEI Microelectronics is to develop innovative microelectronics technologies and components for Automotive, Internet of Things and other key applications (such as space, avionics, and security) and to establish FID in those fields. That objective is to be achieved by combining R&D&I and FID activities of the individual projects of the participating companies in the five TFs. The R&D&I and FID activities of the individual projects are combined in a coherent systemic approach in five TFs, which the Commission confirmed to constitute the individual interlinked components of the 2018 IPCEI Microelectronics. Each TF was found to be complementary to the others and necessary for the achievement of the overall objective of the 2018 IPCEI Microelectronics.
- (74) As described in sections 4.2, 4.3.1 and 4.3.2, each individual project of the Austrian companies is necessary and complementary to the projects already

included in TF1 and TF2 for the achievement of the objectives of the respective TFs and thus, through the TFs' interlinking, for the achievement of the overall objective of the 2018 IPCEI Microelectronics. In this context, they will collaborate with other direct partners in the same TFs (to contribute for the achievement of the objectives of the respective TF), as well as across the other TFs (to contribute to the interlinking of the TFs and thus to the achievement of the overall objective of the 2018 Microelectronics). In particular, the Commission notes that:

- For reaching the objectives of TF1 of improving the energy efficiency of basic microelectronic components (or chips), the Austrian partner's project with improved hardware security and dependability on chip level in the context of the development and the deployment of new low/ultra-low power radiofrequency technologies is aligned with and contributes to the achievement of the overall TF1 objectives. As security aspects require close interaction with technology providers at the hardware level and system manufacturers on the application side, NXP-A's contribution will enhance the integration of the 2018 IPCEI Microelectronics through collaborations with TF2 and TF3 (e.g. partner IFAT for TF2 and Bosch for TF3).
- For reaching the objectives of TF2 in the area of power semiconductors, the contribution of the projects of the Austrian partners provide for new generations of advanced power semiconductor technologies. There will be collaboration with several TF 2 partners, thus supporting the objectives of TF 2. Across the TFs, as an example, the collaboration of IFAT with OSRAM in power management for optical systems also supports TF 5, and the collaboration of AT&S with STM to develop new packaging solutions for highly efficient power applications and the joint activities for power-efficient cores and packages for processors and sensors contribute to TF 1 and TF 3. In that way the Austrian partners' contributions will contribute to the integration of the 2018 IPCEI Microelectronics.
- The three Austrian companies have demonstrated, supported also by signed letters of intent, sufficient IPCEI-induced or -enhanced collaborations in order to contribute to the integration of the 2018 IPCEI Microelectronics, as also shown in Figure 1.

(75) In addition, the Commission notes, as described in section 4.3.3, that the Austrian authorities and companies will be included and commit to contribute actively in the established governance structure of the 2018 IPCEI Microelectronics, in order to contribute to ensuring its coherent implementation.

6.3.2.2. Added value to the 2018 IPCEI Microelectronics by the joining of the three Austrian companies

(76) In order to support the rationale for joining the already established and functioning, by the time of Austria's notification, 2018 IPCEI Microelectronics, the Commission has also analysed the information provided by the Austrian authorities on the added value to the IPCEI stemming from that joining in conjunction with the contributions of each Austrian project. The Commission considers that joining an existing IPCEI is justified where it would enrich the IPCEI by important contributions to its objectives, integration, collaborations, scope, and contribution to the specific eligibility criteria applicable to it (in this particular case, to its R&D&I and FID content).

- (77) Taking note of the views of the Austrian authorities (see section 4.5 above), and given the nature of the 2018 IPCEI Microelectronics, the Commission considers as the most substantial manifestation of the added value that each of the three companies will bring into the 2018 IPCEI Microelectronics the following technology- and/or collaborations- related contributions:
- a. For NXP–A: addressing the security aspect combined with energy efficiency, which is not fully addressed by other IPCEI partners; thus NXP-A will significantly contribute to the objectives, as well as the R&D&I and FID development, of TF1 and the 2018 IPCEI Microelectronics;
 - b. For AT&S: the advanced packaging technology and advanced IC substrate specialized focus, which is not present in such broad terms by other 2018 IPCEI Microelectronics partners, will represent a significant contribution to the objectives, as well as the R&D&I and FID development, of TF2 and the 2018 IPCEI Microelectronics;
 - c. For IFAT: the technology carried out by IFAT in Power semiconductors subtask is not sufficiently addressed or not addressed by other IPCEI partners or Infineon DE; in addition, within the IPCEI-induced collaborations IFAT will set up a strategic collaboration with STM (FR/IT) and Bosch to jointly develop specific requirements for future 300 mm Power Silicon raw wafers technology to enable innovation for future Silicon 300mm power semiconductor-based raw wafer engineering. In those ways IFAT will significantly contribute to the objectives, as well as the R&D&I and FID development, of TF2 and the 2018 IPCEI Microelectronics.
- (78) In addition, the Commission considers that important added value of the notified joining to the 2018 IPCEI Microelectronics is to be also found in terms of:
- d. Increased collaborations between the 2018 IPCEI Microelectronics partners by adding new IPCEI-induced or IPCEI-enhanced collaborations of the three Austrian companies, thus contributing to its integration;
 - e. Increased spillovers generated by the 2018 IPCEI Microelectronics, due to the new, additional spillovers, individually committed to by the three companies.
- (79) The different aspects of the joining Austrian companies' contribution to the eligibility criteria are assessed in the relevant sub-sections of section 6.3.2.
- (80) In view of the above, the Commission concludes that the notified participation of the three Austrian companies to 2018 IPCEI Microelectronics adds value to that IPCEI by bringing important contributions to its objectives, integration, collaborations, scope, and R&D&I and FID content. The participation of the Austrian beneficiaries does not put into question the nature of the 2018 IPCEI Microelectronics as an “integrated project” for the purposes of the IPCEI Communication. On the contrary, if the participation of the Austrian beneficiaries in the IPCEI has an impact in that regard, it is to support the integrated nature of the 2018 IPCEI Microelectronics, as they are inserted in its common structure and programme, and aim at and contribute to the objectives of

the respective TFs, which are necessary and complementary for the achievement of the important common European objective pursued by the 2018 IPCEI Microelectronics.

6.3.2.3. *Common European interest*

(81) In order to establish that a project qualifies as being of common European interest, the IPCEI Communication sets out general cumulative criteria (section (a)), as well as general positive indicators (section (b)). In addition, the IPCEI Communication specifies certain criteria depending on the type of the project (section (c)). The Commission has already established that 2018 IPCEI Microelectronics complies with those criteria. Therefore in the following sections the Commission analyses how the Austrian partners joining to the 2018 IPCEI Microelectronics contributes to meeting those criteria and indicators.

a) General cumulative criteria

i. Important contribution to the Union's objectives

(82) According to point 14 of the IPCEI Communication, the project must contribute in a concrete, clear and identifiable manner to one or more Union objectives and must have a significant impact on the competitiveness of the Union, sustainable growth, addressing societal challenges or value creation across the Union.

(83) According to point 15 of the IPCEI Communication, the project must represent an important contribution to the Union's objectives, for instance by being of major importance for one of the strategies or policies listed, which explicitly include, the Union's flagship initiatives such as the Innovation Union European strategy, the 2030 framework for climate and energy policies, the Energy Strategy for Europe and the Integrated Industrial Policy for the Globalisation Era.

(84) The Commission has already established in the 2018 decision that the 2018 IPCEI Microelectronics contributes in a concrete, clear and identifiable manner to several Union objectives and has a significant impact on the competitiveness of the Union, sustainable growth, addressing societal challenges or value creation across the Union²².

(85) For the notified measure, the Austrian authorities have submitted information showing how the Austrian direct partners joining 2018 IPCEI Microelectronics, will contribute (by their individual projects) in concrete terms to the important Union objectives, including to the Union strategic objectives, pursued by the 2018 IPCEI Microelectronics. In particular, those contributions include:

1. Contribution to the KETs strategy²³ and the microelectronics strategy²⁴ through increased investments supporting the European roadmap for

²² See recitals (279) to (290) of the 2018 decision.

²³ COM(2012) 341 final of 26.6.2012 – “A European strategy for Key Enabling Technologies – A bridge to growth and jobs”

²⁴ COM(2013)298 final 23.5.2013 “A European Strategy for Micro- and Nanoelectronic Components and Systems.” COM (2013) 298

industrial leadership in micro- and nanoelectronics and European business development and SMEs. For example, the contributions in TF2 directly target new technologies for More-than-Moore (e.g. novel packaging solutions and miniaturization) as listed in the KETs Communication, while in TF1 the contribution of technologies for wireless hardware security is a topic of foremost European interest²⁵, which, however, was not yet included for UWB access security in the 2018 IPCEI Microelectronics;

2. Further strengthening of the already existing (or targeted with 2018 IPCEI Microelectronics) European capabilities and help bridging vital gaps in key European industrial value chains based on KETs. For instance, the Austrian contributions in TF2 target new wide bandgap materials and process technologies, which will be key for future innovation capabilities, including in the high-performance power electronics domain. The contribution to TF1 target security and reliability of energy-efficient and secure UWB and battery-management systems and addresses application areas and implementing novel technologies that have been not yet targeted in the 2018 IPCEI Microelectronics;
3. The Austrian contribution will also enable value creation in downstream industries. For instance, the contributions to TF1 will enable novel products and services for secure access and localization with novel application potential in automotive, IoT and other sectors (i.e. health or energy) and building access markets. The contributions to TF2 will enable innovative products in markets such as the energy, mobility, and automotive markets. They will provide for new semiconductor packaging technologies, functional cores, and miniaturisation of test and reference boards, which were not present in the 2018 IPCEI Microelectronics but are key for downstream innovations which exploit further miniaturization, as well as for innovations in high frequency (HF) electronics. In that way the contributions to TF2 will enable the emergence of new products in the electronics industry, including new applications in automotive markets.
4. In the area of strategic European value chains, the contributions of the Austrian partners help to close value-chain gaps in the interconnect and integration parts, which were not yet addressed in the 2018 IPCEI Microelectronics. In addition, the added emphasis in TF2 on new wide bandgap materials will help create critical mass in a domain of key importance for the design of energy-efficient electronics, which, in turn, will be key to develop European reliability in the field of new power semiconductor materials as addressed in TF2. The same evaluation holds good for innovations in security and reliability, enhancing user acceptance and reducing time to market for energy efficient chips, in TF1.
5. The Austrian contributions also will help realize the strategy described in the European Green Deal²⁶ and to the New Industrial Strategy for Europe²⁷

²⁵ E.g. Commission Recommendation (EU) 2019/534 of 26 March 2019 Cybersecurity of 5G networks.

²⁶ Communication from the Commission, to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, *The European Green Deal*, COM(2019) 640 final, 11.12.2019.

which both prioritize energy efficiency and aim at improved sustainability of the digital sector. The contributions of the Austrian partners focus on process technologies facilitating the broad roll-out of energy-efficient technologies, for example based on wide band gap material process and integration technologies as targeted in TF2, or innovation on security and reliability for energy-efficient UWB technology platforms in TF1. Moreover, the Green Deal also targets those sectors prioritised by the Austrian contributions, i.e. energy security and efficiency, mobility, and buildings. The Austrian contribution also concerns advanced packaging technologies through integrating know-how from the substrate with component integration and high-end printed circuit board (PCB) knowledge. It adds to the existing 2018 IPCEI Microelectronics to address the whole value chain from the material to the system (and board) level as described in the European strategy.

- (86) Based on the foregoing, the Commission concludes that the Austrian partners joining 2018 IPCEI Microelectronics will contribute to the important Union objectives to which the 2018 IPCEI Microelectronics contributes, in a concrete, clear and identifiable manner.

ii. Member States involved

- (87) Point 16 of the IPCEI Communication also requires that more than one Member State be involved. With Austria joining the 2018 IPCEI Microelectronics, that IPCEI involves an additional Member State.

iii. Positive spillover effects generated by Austrian partners joining 2018 IPCEI Microelectronics

- (88) As required by points 16 and 17 of the IPCEI Communication, an IPCEI must benefit the European economy or society via positive spillover effects²⁸.
- (89) The IPCEI Communication requires for spillover effects to be identified at all the following levels: beyond the participating Member States ("European economy or society"); beyond the aid beneficiaries ("not be limited to the undertakings"); beyond the sector(s) in which the aid beneficiaries are active ("... or to the sector concerned").
- (90) The Commission recalls that insofar as the IPCEI Communication allows higher aid intensities and a wider scope of eligible costs for activities, including FID which is not covered by the R&D&I State aid rules, the spillover efforts required under the IPCEI Communication should in principle go further than those required under the general R&D&I rules. Furthermore, spillover effects should be generated not only by the R&D&I activities, but also by the FID

²⁷ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, *A New Industrial Strategy for Europe*, COM (2020) 102 final, 10.3.2020.

²⁸ According to the IPCEI Communication, "the benefits of the project must be clearly defined in a concrete and identifiable manner" and "the benefits of the project must not be limited to the undertakings or to the sector concerned but must be of wider relevance and application to the European economy or society through positive spillover effects (such as having systemic effects on multiple levels of the value chain, or up- or downstream markets, or having alternative uses in other sectors or modal shift) which are clearly defined in a concrete and identifiable manner.

activities, especially given that an important part of the funding in this IPCEI flows to FID.

- (91) The Commission recognised in its 2018 decision as being benefits of wider relevance to the European economy or society, generated by the 2018 IPCEI Microelectronics, the combination of the spillovers at the level of the 2018 IPCEI Microelectronics with the ones at the level of the individual companies. Those cover the spillovers targeted at the dissemination of the 2018 IPCEI Microelectronics-related results in the areas of non-IP-protected knowledge, IP-protected knowledge and FID, as well as spillover effects in downstream markets,.
- (92) The Commission notes that the Austrian authorities have submitted information (see section 4.4 above) concerning the individual companies' commitments for spillovers on different dissemination levels, types of spillovers and specific activities, out of which spillovers complying with the requirements as set by the IPCEI Communication (recitals (88) to (90) and footnote 28) will be generated by the Austrian companies joining the 2018 IPCEI Microelectronics. Firstly, the Austrian participants have committed to actively contribute to the dissemination activities as undertaken at the overall IPCEI level. Secondly, each company has committed individually to effect further dissemination of the different types of IPCEI-generated knowledge via different dissemination channels, in order to ensure that the benefits will reach wider European economy and society. Finally, where the pre-IPCEI market shares on specific market segments were already significant enough, the Commission made sure that the proposed spillovers by that company related to the particular technology will be reinforced (see recitals (170) - (171) below).
- (93) In particular, as regards the individually committed spillovers of the non-IP-protected results of the R&D&I and FID activities (see section 4.4. and in particular recitals (39), (40), (44) and (45)), the Commission takes note that they will be disseminated to different types of audience, ranging from general public, scientific and professional audience, and will be effected through different means, including through conferences, publications, workshops, university education activities (PhDs, University chairs, etc.). The Commission notes also the dissemination planned through European R&D Collaborative system, as well as standardisation and clusters activities.
- (94) As regards the committed spillovers to disseminate the IP-protected results (see section 4.4. and in particular recitals (41) and (45)), the Commission welcomes the general commitment to licencing and notes the strong emphasis on dissemination via collaborative activities with different players, including research organisations and undertakings of different sizes.
- (95) For the spillovers generated specifically out of FID (see section 4.4. and in particular recitals (42) and (45)), the Commission notes in addition the emphasis on technology forums and workshops, early access to developed technologies for research organisations and SMEs, online simulations tools, etc., some of which would even reach downstream markets and indeed go beyond those markets.
- (96) Finally, the Commission observes that the committed spillovers designed to ensure dissemination outside the targeted sector (see section 4.4. and in

particular recitals (43), (44) and (45)) encompass additional dissemination commitments, beyond those through conferences, networking activities and workshops. Those committed spillovers address, in addition to those downstream applications²⁹ targeted by the 2018 IPCEI Microelectronics, other potential areas of deployment of the new technologies and methods developed in the IPCEI by the Austrian companies (for instance, in medical, biological testing and measuring applications, or for re-using copper).

- (97) In addition, the Commission takes note of the collaborative activities of the Austrian partners with research organisations and undertakings, not direct participants in the 2018 IPCEI Microelectronics (see section 4.4 and in particular recitals (44) and (45)), which will be IPCEI-induced - either strengthened and/or newly established. Those collaborations will contribute to the generation of IP, will reinforce the dissemination of the IPCEI-created knowledge alongside the supply chain and for the downstream applications, and will benefit the microelectronics eco system.
- (98) Based on the above, the Commission considers that the benefits stemming from the three Austrian companies joining the 2018 IPCEI Microelectronics are clearly defined in a concrete and identifiable manner. It also considers that the Austrian authorities have adequately demonstrated how their participation benefits interested stakeholders beyond those directly involved in the IPCEI and beyond the sectors concerned. Therefore, in view of the above the Commission considers that this eligibility condition is satisfied, in accordance with points 16 and 17 of the IPCEI Communication.

iv. Co-financing by the aid beneficiaries

- (99) As required by point 18 of the IPCEI Communication, co-financing of the beneficiaries is present, as evidenced by the fact that aid to individual beneficiaries does not cover 100% of the individual projects' costs. In addition, the Commission estimates that the cash flow needs for the implementation of the beneficiaries' projects are approximatively EUR 677 million in total, which is significantly higher than the total aid to be granted by the Austrian authorities.

v. Environmental harmful subsidies and environmental impact

- (100) The Austrian authorities have confirmed that the public financing of the three Austrian companies joining the 2018 IPCEI Microelectronics does not relate to environmentally harmful subsidies. Therefore it is not in conflict with the principle of phasing out such subsidies recalled by the Resource Efficiency Roadmap, as well as several Council conclusions, as required by point 19 of the IPCEI Communication.
- (101) On the contrary, the Austrian authorities submit that the Austrian companies' projects will contribute to new power electronics technologies, including through improved security of energy-efficient chips for radiofrequency solutions. In that way, the Austrian contribution also targets a substantial reduction of CO₂ emissions by enabling new, more energy-efficient, technologies and the consequently triggered innovations in automotive, IoT and other applications. In addition, they also submit that the contributions of the

²⁹ Security solutions, automotive, mobility and energy applications.

Austrian companies' projects to miniaturisation of microelectronic components imply significant savings of material, including rare and expensive material such as gold, copper and other base material that have a huge negative impact on the carbon footprint of the product. As an example, the Austrian contributions in TF2 could help save 1 g/km CO₂ using novel diodes to improve alternator efficiency and 3.5 g/km using smart rectifier devices.

- (102) Based on all the above considerations, the Commission considers that the projects of the three Austrian companies contribute to the general cumulative criteria for eligibility of the 2018 IPCEI Microelectronics.

b) General positive indicators

- (103) The Commission recalls that in the 2018 decision it has taken note of several general positive indicators which are present as regards the 2018 IPCEI Microelectronics³⁰. The Commission takes note that the participation of Austria in the 2018 IPCEI Microelectronics has no impact on the presence of those general positive indicators and that the three Austrian companies specifically contribute to those positive indicators.

- (104) In particular, the Commission notes the Austrian authorities will participate in the governance bodies of the 2018 IPCEI Microelectronics. The Commission participates in the Supervisory Board. In addition, the Austrian authorities have submitted information on how each individual project creates important collaborative interactions, adding together at least 26 IPCEI-induced or -enhanced collaborations with direct partners within the respective TF and across the TFs.

c) Specific criteria

- (105) Point 21 of the IPCEI Communication provides that R&D&I projects must be of a major innovative nature or constitute an important added value in terms of R&D&I in the light of the state of the art in the sector concerned. According to point 22 of the IPCEI Communication, projects comprising of industrial deployment must allow for the development of a new product or service with high research and innovation content and/or the deployment of a fundamentally innovative production process. Regular upgrades without an innovative dimension of existing facilities and the development of newer versions of existing products do not qualify as an IPCEI.

- (106) For the 2018 IPCEI Microelectronics the Commission has already confirmed in its 2018 decision that the R&D&I activities carried out in each of the technology field clearly aim to result in outcomes that will bring the technology development in the relevant technology fields beyond the current state-of-the art, and as regards the FID activities carried out in the technology fields, that it has been sufficiently demonstrated that they allow for the development of new

³⁰ They referred to the facts that all Member States where a semiconductor industry is active were made aware of the creation of the IPCEI Microelectronics at the onset of the project. The Commission facilitated the emergence of the project. The governance structure of the project involves the Commission through participation into the Supervisory Board. Finally, as described above, the project involves important collaborative interactions in terms of number of partners, involvement of organisations of different sectors and the involvement of undertakings of different sizes.

products with high research and innovation content and the deployment of fundamentally innovative production processes.

- (107) In the present case, it is necessary to assess how the Austrian companies' projects also comply with points 21 and 22 of the IPCEI Communication and thereby contribute to the innovative nature of 2018 IPCEI Microelectronics. In doing so, the Commission has applied the same methodology of the analysis as in the 2018 decision.
- (108) For the R&D&I parts of the projects, the Commission has verified at the level of individual aid beneficiaries and per project that each aid beneficiary project carried out in each of the technology fields concerned clearly aims to result in outcomes that will bring the technology development in the relevant technology field beyond the current state-of-the art.
- (109) In particular, the R&D&I activities of the Austrian partners joining TF1 aim to achieve major innovation going beyond state of the art in development of ICs for security and testing innovations of the important and upcoming area of Ultra-Wide Band (UWB) as an RF technology that can use very low energy levels for short-range, high-bandwidth communications over a large portion of the spectrum. Those activities also aim to achieve innovation in smart and secure next generation battery management systems. R&D&I will have the objective to introduce an automotive security IC (a secure element, (sE)) in battery management systems to allow secure authentication in different kinds of applications).
- (110) The R&D&I activities of the Austrian partners joining TF2 will aim to achieve major innovations going beyond state of the art in
- advanced packaging technologies (including developing a new packaging concept),
 - in offering novel possibilities for heterogeneous integration in electronic modules and systems,
 - in further miniaturisation concept
 - in process development for new materials and manufacturing processes, material studies (including selection of material), evaluation for new equipment,
 - developing new production flow with the demonstration of a demonstrator (proof of concept),
 - aim at major steps beyond the state-of-the-art in semiconductor devices for power electronics.
- (111) The analysis of the FID parts of the projects, based on the information provided by the Austrian authorities, confirms that they will allow for development of new products with high research and innovation content, including the deployment of fundamentally innovative production processes.
- (112) In particular, the Austrian contribution will complement the FID activities in TF1 by focusing on:
- innovative test and validation concepts,

- pre-qualification challenges,
 - step-ups in design for testing and validation strategies (including on improvement of the testability of ICs with regard to demands for improved connectivity in smart mobility applications (AVT)),
 - innovative device characterization (testing and verification of IC functionality (AVT and secure element (sE))),
 - security evaluation and certification, and
 - system level design for secure energy-efficient Battery Management System.
- (113) The Austrian partners will complement the FID activities in TF2 by focusing on highly innovative power technology generations and packaging solutions exceeding the current state of the art in power applications, including the FID of
- functional cores,
 - novel packaging applications for high frequency electronics and miniaturization building blocks for novel test and reference boards,
 - dedicated process and material development,
 - testing and process stabilization,
 - advancements in reliability and quality (application driven),
 - innovative failure analysis and material characterization,
 - next level of digitalization and innovations in Industry 4.0 technologies.
- (114) Based on the above, the Commission considers that the projects for which Austria intends to grant aid contribute to the fulfilment of the specific criteria established by the IPCEI Communication in points 21 and 22.

6.3.2.4. Contribution to the importance of 2018 IPCEI Microelectronics

- (115) According to section 3.3 of the IPCEI Communication, in order to qualify as an IPCEI, a project must be important quantitatively or qualitatively. It should either be particularly large in size or scope and/or imply a very considerable level of technological or financial risk.
- (116) In view of adding to the 2018 IPCEI Microelectronics an additional participating Member State, as well as additional direct partners, which will contribute to the achievement of the IPCEI objectives by performing projects that entail significant technological and financial risks due to their R&D&I and FID content, amount of total eligible costs and State aid envisaged, the Commission considers that the projects of the Austrian companies contribute to the importance of the 2018 IPCEI Microelectronics.

6.3.2.5. Conclusion on the eligibility conditions

- (117) In view of the above, the Commission concludes that the projects of the three Austrian companies contribute to the compliance of 2018 IPCEI Microelectronics with the general eligibility criteria of the IPCEI Communication.

6.3.3. *Compatibility criteria*

- (118) When assessing the compatibility with the internal market of aid to promote the execution of an IPCEI, the IPCEI Communication (point 25) requires the Commission to take into account a number of criteria, as elaborated below. It also requires that the Commission carries out a balancing test to assess whether the expected positive effects outweigh the possible negative effects (point 26).
- (119) Given the nature of the 2018 IPCEI Microelectronics and that it fulfils the eligibility criteria set out in section 3 of the IPCEI Communication, the Commission considers that the presence of a market failure or important systemic failure can be presumed in line with point 27 of the IPCEI Communication.
- (120) The analysis of the compatibility criteria has been performed by the Commission at the level of individual aid beneficiaries (i.e. by each Austrian company joining) and per project, applying the same methodology as for the 2018 IPCEI Microelectronics.

6.3.3.1. *Necessity and proportionality of aid*

a) Necessity of aid

- (121) According to point 28 of the IPCEI Communication, the aid must not subsidise the costs of a project that an undertaking would anyhow incur and must not compensate for the normal business risk of an economic activity. Without the aid, the individual projects of the Austrian companies to be included in the 2018 IPCEI Microelectronics realisation should be impossible, or it should be realised in a smaller size or scope or in a different manner that would significantly restrict its expected benefits. Footnote 24 thereto requires that the aid application must precede the starts of the works³¹. According to point 29 of the IPCEI Communication, the Member State should provide the Commission with adequate information concerning the aided project, as well as a comprehensive description of the counterfactual scenario, which corresponds to the situation where no aid is awarded by any Member State.
- (122) The Commission has verified that all three companies have submitted their aid applications to the Austrian authorities before the start of their work on their individual projects to be included in 2018 IPCEI Microelectronics, therefore the formal incentive criterion, as required by the IPCEI Communication.
- (123) The Austrian authorities have demonstrated that the aid has an incentive effect for all aid beneficiaries, i.e. that the aid will induce a change of the behaviour of the beneficiaries by means of allowing them to engage in their individual projects in their full ambitious scope and in the time span as notified. More specifically, that information is revealed in the counterfactual scenarios for the aid beneficiaries.
- (124) The Austrian authorities submit that absent the granting of aid all three Austrian companies have considered other (extra-Union) locations for performing their projects, taking in view different factors, such as innovation capabilities, research

³¹ Start of works is defined in the IPCEI Communication as either the start of construction works on the investment or the first firm commitment to order equipment or other commitment that makes the investment irreversible, whichever is the first in time.

personnel, cost/performance and risk analyses, etc. Some of them, absent the aid, would undertake much lower or time-delayed investments (in R&D&I and FID), increasing the risk and uncertainty of the technical outcomes and the availability of the products to be developed, leading to a later market entry and less technological expertise in Europe, while for others there would not have made any sense to implement the project with reduced scope, or they would have performed it elsewhere. For two of the companies the counterfactual is presented only as a baseline scenario and only for one company it is presented in a slightly more detailed manner with some evidence. Even in the latter case the alternative has not been further substantiated by financial calculations of the costs, revenues and profitability to be compared with the scenarios of the aided project.

- (125) From the foregoing, the Commission concludes that there are no alternative projects within the meaning of point 29 of the IPCEI Communication.
- (126) The Commission further verified that the aid was necessary to induce a change of behaviour by the aid beneficiaries. For the companies with no counterfactual scenario within the meaning of the IPCEI Communication, that change of behaviour is assumed to occur when the individual projects achieve a sufficient degree of profitability. The sufficient degree of profitability corresponds to the company weighted average cost of capital (WACC), as commonly applied by them as minimum internal benchmark for selection of projects. As represented by the funding gap analyses, submitted by the Austrian authorities for all aid beneficiaries, the aid is needed in order to cover the funding gap of the individual projects (the net present value of all these projects, calculated by using the respective WACC as a discounting factor, is negative).
- (127) In view of the above, the Commission considers that the Austrian authorities have sufficiently demonstrated that the aid measures do not subsidize the costs of the projects that the participating companies would anyhow incur and do not compensate for their normal business risks.
- (128) Considering the fact that the aid measures enable the participating companies to pursue ambitious projects, which would not have been pursued in the absence of the notified aid, the Commission concludes therefore that the notified aid measures are necessary to induce the change of the behaviour of the aid beneficiaries.

b) Proportionality of the aid

- (129) According to point 30 of the IPCEI Communication, in the absence of an alternative project, the Commission will verify that the aid amount does not exceed the minimum necessary for the aided project to be sufficiently profitable, e.g. by making it possible to achieve an internal rate of return (IRR) corresponding to the sector- or firm-specific benchmark or hurdle rate. According to point 31 of the IPCEI Communication, the maximum aid level should be determined with regard to the identified funding gap and to the eligible costs. The aid could reach up to 100% of the eligible costs, provided that the aid amount does not exceed the funding gap.
- (130) The Austrian authorities have submitted, for all companies, detailed calculations of the eligible costs for their IPCEI-specific R&D&I and FID projects and funding gap calculations. The individual project descriptions include also detailed

contents of the companies' individual R&D&I and FID projects. In particular, they include the R&D&I activities to be performed, the technology risks and challenges, as well as the state-of-the art in the sector concerned. It is also explained how the companies' R&D&I activities bring about important added value in going substantially beyond the state of the art and are of major innovative nature. They also detail how the FID allows for the development of new products with high R&D&I content and/or fundamentally innovative production processes and contains a very important R&D&I component. Furthermore they also detail the eligible costs for the R&D&I and FID projects.

- (131) In its assessment of the eligibility of the costs, for the individual R&D&I projects, the Commission first verified individually for all aid beneficiaries that their projects contain R&D&I activities of major innovative nature, going substantially beyond the state-of-the art. That verification was based on the nature of the activities to be performed, the technology challenges and risks to be overcome, as demonstrated by each company. The methodology for the assessment, applied in the 2018 decision was used. The method undertaken for assessing the innovativeness beyond global state of art of the company projects involved both a quantitative and qualitative analysis. The quantitative analysis, when feasible, relied on comparison of key figures of merit in the form of numerical parameters identifying on a global level the specific technology performance in the field, namely technology benchmarking. If a quantitative analysis was not possible, typically in the context of a project (or parts of a project) consisting in specific innovative technology solutions which are not measurable, then a qualitative assessment was carried out. This also included research activities related to the needs and their proposed solutions on the global market or in the field of the latest literature.
- (132) The Commission consistently verified for all individual projects that a high innovation level is to be reached, and that the activities do not merely allow for an incremental evolution of the already existing technologies or products. In addition, the Commission verified, when in some of the initial partners' project a type of technology was already present in the 2018 IPCEI Microelectronics, that the Austrian company's project differs from the other project's objectives and targeted outcomes in terms of technology development.
- (133) As an example, the main innovations aimed at by the Austrian companies under the 2018 IPCEI Microelectronics, will be:
- NXP-A: i) virtual testing platform for Radio-Frequency applications integrating the simulation environment verification in one solution ii) innovative security solution meeting security and quality requirements of automotive smart access and battery management.
 - AT&S: innovative power- and energy-efficient packaging and interconnection solutions for electro-mobility and high frequency electronics, including through the integration of specific materials new compared to existing solutions, miniaturization processes, advanced development and testing capabilities.
 - IFAT: i) next generation Power technology based on classical Silicon substrate as well on enhanced wide bandgap material for mobility solutions ii) New surface protection processes for packaging of power devices and sensor for mobility applications iii) New IoT solutions integrating power device and logic

functionality (CD technologies), namely Intelligent Power solution, for mobility applications.

- (134) Based on the analysis for each aid beneficiary, performed following the methodology as described in the preceding recitals, the Commission therefore concludes that the individual R&D&I projects of all aid beneficiaries contain R&D&I of major innovative nature, going beyond the state-of-the art in the sector concerned.
- (135) Moreover, the Austrian authorities have verified that the related R&D&I costs of each aid beneficiary comply with the Annex on eligible costs to the IPCEI Communication. The Commission confirms that these costs fulfil the conditions set out in the Annex to the IPCEI Communication³².
- (136) For the individual FID projects, the Commission verified and confirmed, in order to determine whether they qualify as FID under the IPCEI Communication, that the FID activities:
- a. Concern “the development of a new product or service with high research and innovation content and/or the deployment of a fundamentally innovative production process”³³;
 - b. Do not relate to “regular upgrades without an innovative dimension of existing facilities and the development of newer versions of existing products”³⁴;
 - c. Consist in “the upscaling of pilot facilities, or [to] the first-in-kind equipment and facilities which cover the steps subsequent to the pilot line including the testing phase;
 - d. Do not correspond to neither mass production nor commercial activities”³⁵;
 - e. Relates to “the capital and operating expenditures ("CAPEX" and "OPEX"), as long as the industrial deployment follows on from an R&D&I activity and itself contains a very important R&D&I component, which constitutes an integral and necessary element for the successful implementation of the project”³⁶.
- (137) Having regard to the specificities of the microelectronics sector and the participating companies’ individual FID projects, the Commission has assessed

³² In particular the Commission has also verified that only the depreciation costs corresponding to the life of the project are considered for the calculation of the eligible costs

³³ Point 22 of the IPCEI Communication, first sentence.

³⁴ Point 22 of the IPCEI Communication, second sentence.

³⁵ Footnote (1) in the Annex to the IPCEI Communication.

³⁶ Point (g) in the Annex to the IPCEI Communication. The wording of the IPCEI Communication implies that the very important R&D&I component that needs to be embedded in the FID costs in order for them to be eligible constitutes a limit both in scope and time on the eligible FID costs.

the eligibility of FID costs for each aid beneficiary according to the above criteria, in the following manner, which is consistent with the analysis performed in the 2018 decision.

- (138) That assessment took into account, for each FID part of the projects specifically, the integration of processes in the industrial environment, the necessity of process, equipment and/or component re-development in relation with the complexity of the line, the technological complexity and progress going substantially beyond the state-of-the-art of the targeted components and systems, the applications addressed and their specific constraints in particular in terms of safety and security in relation to the components it concerns. When assessing the setting up of processes, activities are only considered eligible where they relate to the introduction of processes that transfer the R&D&I performed before FID and are critical for the functionality of the resulting product. Those activities were assessed against the most up-to-date publicly available information related to the resulting product (including scientific and technical literature journals, corporate technical scientific publications, corporate and news, patents).
- (139) The Commission finds for all aid beneficiaries, for each FID project, that it concerns a new product with high R&D&I content or a fundamentally innovative production process.
- (140) The Commission further finds for all aid beneficiaries, for each FID project, that the FID concerns technologies with high R&D&I content or fundamentally innovative nature, and those highly innovative technologies are a result from a preceding R&D&I activity but yet they still require very important R&D&I to be carried out even after the R&D&I phase, i.e. to put those technologies into FID requires very important R&D&I; as such, the FID of those specific technologies contains a very important R&D&I component on its own (quantitatively or qualitatively), and that R&D&I in the FID phase is indispensable for the successful FID of the technologies.
- (141) In relation to the very important R&D&I component, the Commission finds that for all beneficiaries an adequate demonstration of the very important (in quantitative and/or qualitative terms) R&D&I activities in their FID, which constitutes an integral and necessary element for the successful implementation of their individual projects, is provided. In particular, the Commission verified for each FID project that the planned important R&D&I during the FID, necessary to solve outstanding technological roadblocks, among others in terms of process integration, design stability, testing, packaging of components and/or security and safety of components, in the context of the complex technologies and large number of processes involved, is demonstrated. Mere engineering work accompanying normal activities of FID does not constitute the required R&D&I in FID. In particular, the assessment of the very important R&D&I component in the FID of each aid beneficiary took into account the following issues.
- (142) In its assessment, the Commission verified, on the basis of the parameters established in recitals (136) to (138), that the FID is not a mere regular upgrade, without an innovative dimension, of existing facilities, or a development of newer versions of existing products or technologies.
- (143) The Commission moreover verified that the FID as described by the Austrian authorities for the different aid beneficiaries does not cover mass production or

commercial activities. The Austrian authorities have presented for each individual project in each participating company's project portfolio the cut-off point (and the criteria used) between the FID and the mass production from an industrial point of view. Those cut-off criteria correspond to measurable and controllable key performance indicators ("KPIs") as established for 2018 IPCEI Microelectronics, and also as specifically applicable to each individual project. In addition, for each company, the Austrian authorities separately described and quantified the R&D&I effort that would still be taking place during the FID stage, as well as the testing, sampling and qualification process implemented by each company. They explained further that during the FID phase, the production process will not yet be stable.

- (144) In that connection, the Commission first examined the important (qualitatively and/or quantitatively) R&D&I that still needs to be performed within the FID in order to reach the different KPIs for identifying the moment in time that they reach a stabilised production process and mass production. Any costs relating to production occurring after that moment cannot be included in eligible FID costs. The Commission verified that they were not included in the eligible costs.
- (145) Further, the Commission verified that the activities taking place during the FID phases notified by the Member States for the different participating companies correspond indeed to FID activities and do not point at mass production or commercial activities. Thus, in addition to verifying that the FID phase is accompanied by a significant R&D&I effort until the end of FID for each company, the Commission also verified that the activities undertaken during those periods do not constitute commercial activities both in quantitative and qualitative terms.
- (146) The Commission's assessment confirms that the notified FID phases of all aid beneficiaries comply with the requirement of the IPCEI Communication not to cover neither mass production nor commercial activities and that the eligible costs for the FID phase of each beneficiary relate to FID within the meaning of the IPCEI Communication.
- (147) With regard to the eligible FID costs, the Commission also verified that for cost items that are depreciated during several years, only depreciation costs until the end of FID are included in the eligible costs.
- (148) Operating costs should be limited both in scope and in time to the R&D&I that the FID entails according to the Annex to the IPCEI Communication. For operating costs, the Commission examined thoroughly the costs information provided by the Austrian authorities and considers the requirement fulfilled.
- (149) The Commission moreover reviewed the FID cost information provided by the Austrian authorities and considers that they fulfil the conditions set out in the Annex to the IPCEI Communication.
- (150) Based on the above, the Commission finds that the costs notified by the Austrian authorities in relation to all aid beneficiaries constitute eligible costs and fulfil the requirements of the Annex to the IPCEI Communication.

- (151) The Commission reviewed in detail the funding gap calculations provided by the aid beneficiaries and verified the main assumptions in those calculations against publicly available data.
- (152) The funding gap refers to the net present value of the difference between the future cash in- and out-flows projected over the lifetime of the investment, i.e. including the financial streams related to the mass production following from the individual projects. In line with the IPCEI Communication, the Commission assessed the funding gap of each project at the level of each beneficiary.
- (153) The Commission verified two main assumptions underpinning the calculation of the funding gap. First, the Commission checked that the participating company's internal WACC, which is the rate used to discount the cash flows determining the funding gap, corresponds to the company's internal WACC and is calculated in line with the best practices in finance. The Commission also constructed a company-specific benchmark WACC based on publicly available data, with the aim of assessing the plausibility of the company internal WACC.
- (154) Second, the Commission made sure that the participating companies consider all the revenues that can be reasonably expected from the investments and costs included in their business plan. To that end, the Commission verified that the length of the revenue streams is in line with the expected life cycle of the product. The Commission also assessed whether those revenue streams, taking into account the individual projects' costs and investments, lead to a reasonable profit (i.e. EBIT) margin over the course of the business plan period, especially during a mass production phase. In addition, the Commission checked that the participating companies include a terminal value among their revenues. That value refers either to the residual value of capital investments (equipment and buildings) at the end of the planning period or to the terminal value of their projects resulting from the additional profits each participating company might expect to earn at a future horizon beyond the planning period.³⁷
- (155) Taking into account the foregoing, the Commission considers that, based on discounted values, the aid to all aid beneficiaries does not exceed the individually identified funding gap of each beneficiary and neither does it exceed the eligible costs. The Commission notes that the State aid notified by the Austrian authorities for each aid beneficiary in this particular case is limited by their respective funding gaps (see Table 3)
- (156) Therefore, the Commission considers that the aid to be granted by the Austrian authorities is proportionate.

6.3.3.2. Prevention of undue distortions of competition and balancing test

a) Appropriateness

- (157) According to point 40 of the IPCEI Communication, the Member State should provide evidence that the proposed aid measure constitutes the appropriate policy instrument to address the objective of the project.

³⁷ The terminal value of the project is calculated assuming cash flows in the last year of the business plan will grow at a constant rate in the future.

- (158) The Austrian authorities submit that State aid under the IPCEI rules is the only appropriate policy instrument to support the notified Austrian projects, as well as explain why grants are the appropriate State aid instrument. In their argumentation they point that joining the 2018 IPCEI Microelectronics provides significant and unique opportunities for participating Austrian companies, thus IPCEI State aid is the only instrument allowing the State to support companies in linking R&D&I and FID and pooling technological knowledge and know-how, and experiences through cooperation with companies from other Member States and through the accompanying spill-over activities.
- (159) In addition, as explained in the individual companies' project portfolios, due to the high technology and financial risks associated with the technological groundbreaking R&D&I in microelectronics, as well as due to low profitability and capital-intensive investments, without the State aid support in the form of grants the likelihood that both technological innovation and novel contributions to the value chain would not be carried out (at the very least of such scope or speed, or would be shifted to other regions) increases.
- (160) The Commission shares the views of the Austrian authorities that given the level of ambitions pursued by 2018 IPCEI Microelectronics, its size and synergies it requires, the public support through the notified State aid measures based on the IPCEI Communication to the individual projects of the three companies with which they will join the 2018 IPCEI Microelectronics constitutes the appropriate policy instrument. Given the level of risk and uncertainty, the Commission considers appropriate the use of direct grants as appropriate State aid instrument.

b) Identification of the potential risks of distortions of competition

- (161) According to point 41 of the IPCEI Communication, aid can be declared compatible if the negative effects of the aid in terms of distortions of competition and impact on trade between Member States are limited and outweighed by the positive effects in terms of contribution to the objective of the common European interest. The assessment of the potential negative effects of the aid under the IPCEI Communication needs to consider, in particular, the effects on competition between undertakings in the product markets concerned, as well as risks of market foreclosure and dominance (points 42 and 43 of the IPCEI Communication).
- (162) The Austrian authorities provided detailed information and reasoning on the absence of undue distortions to competition in relation to each specific aid measure for the Austrian companies joining 2018 IPCEI Microelectronics. In particular, the Austrian authorities argue that markets affected are global in geographical scope and expected to grow in the future years, or, for some of them, yet in their infancy. Some of the Austrian companies would also aim to enter new market segments with the products developed with the aid. In addition, the Austrian authorities argue that the participating companies face intense competition notably from the many established competitors (also non-European). The Austrian authorities also argue that the current and expected market shares of the participating companies already active in markets affected by the aid do not raise any concerns in respect of potential distortions of competition, including no risk of market foreclosure or dominance.

- (163) The Commission's analysis of undue distortions to competition is always specific to the particular case. The assessment of the potential negative effects of the aid under the IPCEI Communication needs to consider, in particular, the effects on competition between undertakings in the product markets concerned, as well as risks of market foreclosure and dominance.
- (164) The three Austrian companies joining 2018 IPCEI Microelectronics are active each on different markets or even market segments. Due to the specificity of the aid measure (joining an already established IPCEI), in the same vein as for the analysis of all eligibility and compatibility conditions, the Commission followed the same approach and methodology as applied in the 2018 decision. For that reason, in this particular case, the Commission applied a two-step approach, as described below, in order to identify potential significant competition distortions that might result from the aid measures.
- (165) First, the Commission screened participating companies based on a uniformly available metric on European production (the "PRODCOM" statistics on the production of manufactured goods collected by the Member States). Second, the Commission reviewed the more detailed information provided for each participating company by the relative Member State and carried an overall assessment of competition distortions based on that information.
- (166) To that end, the Commission requested and received data on the aid recipients' past production values by 8-digit PRODCOM classification for the products categories related to the aided project. Further, the Commission used two main indicators for the assessment:
- The share of the company's production value in European production in the PRODCOM category over the last five years with data available;
 - The ratio of aid on annual production value.
- (167) The indicators used by the Commission to filter companies as raising potential competition concerns can be considered as a proxy to the current and future horizontal market shares. A larger share in European production value might be correlated with a larger market share in related relevant markets. The reasoning for using the first indicator is that aid flowing to companies with larger sectoral production shares is likely to be more distortive to competition because those beneficiaries may use the aid to expand an already significant production share. In that first screening the Commission considers, on a conservative basis, *prima facie* potentially problematic those cases in which an aid beneficiary would have a share of European production higher than 10%. That screening is conservative because the chosen threshold of 10% is a relative low threshold and because the share is computed on European production, when production also has a global dimension and sales in Europe are both affected by European and non-European production for the products and services concerned by the Microelectronics IPCEI.
- (168) The reasoning for using the second indicator is that it is an approximation for the ability of the aid to increase the production share of the recipient at the cost of competitors. Taken together, the two indicators filter the companies that have shown high productions shares in the Union in the aided products and receive an amount of aid that is likely to expand their production share further. Higher

values on those two indicators may also imply a higher potential risk of market foreclosure and dominance.

- (169) That first screening based on production shares and aid amounts (relative to the production values), identified one potentially problematic case in terms of possible distortion of competition. This means that for the remaining cases the participating companies either have a share of European production below 10%, the ratio of aid on the annual production is low or these companies are new entrants in some of the markets targeted with the products to be developed under the IPCEI Microelectronics.
- (170) In the second screening, the Commission scrutinized the detailed information provided by the Austrian authorities for one beneficiary who holds a significant market share on specific technology market segments. In order to counter any potentially higher competition concerns, including the risk of market foreclosure and dominance, raised by that company on these specific market segments, the Commission has verified that binding commitments have been notified for that company individually. More specifically, that company undertook to engage in significant additional spillover actions to disseminate the knowledge and results generated by it due to joining 2018 IPCEI Microelectronics. Those efforts specifically target the market segments where the potentially higher competition concerns have been identified and aim to deliver benefits to the larger microelectronics ecosystem. The company committed also to follow a proactive approach and to ensure certain numerical targets are reached, and to specifically report on the annual progress of these spillovers.
- (171) Those additional spillovers consist in providing significant in quantitative and qualitative terms MPW and holding specific and targeted workshops, with practical value, addressing predominantly SMEs. Based on the careful assessment of the quality, the quantity and the substance of those additional actions, the Commission considers that they are adequate to counter any potential higher competition concerns for this company and also contribute to the positive effects of the overall 2018 IPCEI Microelectronics.
- (172) Based on the foregoing, the analysis of the detailed information available to the Commission leads to the conclusion that the risks of undue distortions of competition, including of foreclosure or dominance are limited and that any negative impact on competition is outweighed by the positive effects of the three Austrian companies joining 2018 IPCEI Microelectronics. Those positive effects encompass their concrete contributions to the objective of the common European interest (see recitals (82) to (86)) and its benefits of wider relevance to the Union economy that will result, in particular, from the positive spillover effects that will be generated, including dissemination of the R&D&I results (see recitals (88) to (98)).

6.3.3.3. *Transparency*

- (173) The transparency requirement, specified in section 4.3 of the IPCEI Communication, is fulfilled (see recital (56)).

6.3.3.4. *Conclusion on compatibility*

- (174) Based on the assessment under the IPCEI Communication, the Commission concludes that the notified aid measures are compatible with the internal market pursuant to Article 107(3)(b) TFEU.

6.3.4. *Reporting obligation*

- (175) According to point 49 of the IPCEI Communication the execution of the project must be subject to regular reporting.
- (176) The Austrian authorities committed to comply with and follow the reporting obligation as set by the Commission decision for 2018 IPCEI Microelectronics³⁸.
- (177) In particular, this includes:
1. the annual execution of the 2018 IPCEI Microelectronics activities as regards the technical advancements and individually committed spillovers, will be subject to reporting by the participating companies (to their national funding authorities), to annual reports on the progress and results of each of the technology fields and to annual report on the progress of the 2018 IPCEI Microelectronics as a whole (including through key performance indicators);
 2. the participating Member States (including Austria) must provide the Commission with an annual report, containing the progress and results of the 2018 IPCEI Microelectronics, the technology fields and the companies. Those reports will include detailed reporting on the actions undertaken (e.g. number of SMEs pro-actively approached in which Member States) and results achieved by the companies in relation to the spillover actions which the companies have committed themselves to.
- (178) The Commission therefore considers that the reporting obligation on the execution of the projects of the three Austrian companies joining 2018 IPCEI Microelectronics is fulfilled.

³⁸ Recitals (372) and (373) of 2018 decision.

7. CONCLUSION

(179) In view of the above, and in light of the notification of the Austrian authorities, the Commission has decided:

- not to raise objections to the aid on the grounds that it is compatible with the internal market pursuant to Article 107(3)(b) TFEU.

If this letter contains confidential information which should not be disclosed to third parties, please inform the Commission within fifteen working days of the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to the disclosure to third parties and to the publication of the full text of the letter in the authentic language on the Internet site: <http://ec.europa.eu/competition/elojade/isef/index.cfm>.

Your request should be sent electronically to the following address:

European Commission,
Directorate-General Competition
State Aid Greffe
B-1049 Brussels
Stateaidgreffe@ec.europa.eu

Yours faithfully,

For the Commission

Margrethe VESTAGER
Executive Vice-President