RTI Initiative ICT of the FUTURE

National Guideline of the 6th Call for Cooperative R&D Projects between Austria, FFG and China, CAS

Deadline for submission to FFG via eCall and to CAS (extended):

FFG: May 13th 2020, 11:00 Central European Summer Time (C.E.S.T.)

CAS: May 13th 2020, 17:00 China Standard Time (C.S.T.)

Vienna, 14.02.2020

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1 Key Facts at a Glance

The present Call Guidelines provide information about the transnational call of the RTI Initiative 'ICT of the Future' organised by **Austria and the Chinese Academy of Sciences, CAS, China**. The call promotes the bilateral collaboration in application oriented research and development projects. A total of **EUR 1.000.000** in funding is available for Austrian partners. The call is carried out jointly by the Austrian Research Promotion Agency (FFG) and Chinese Academy of Sciences.

Table 1: Overview on key facts

Programme	FFG, ICT of the Future	CAS, Chinese Academy of Sciences
Instrument	Transnational Cooperative R&D project	Transnational Cooperative R&D project
Research Category	Industrial Research or Experimental Development	Basic Research, Industrial Research, Experimental Development
Topics (s. chapter 4)	Mastering complex ICT solutions Conquering data Ensuring interoperability	Mastering complex ICT solutions Conquering data Ensuring interoperability
Funding amount per project	min. EUR 100.000 to max. EUR 1.000.000	CNY 300.000 p.a. (approx. EUR 38.000 per year).total: max. CNY 900.000 for 3 years
Funding rate	max. 85%	approx. 50% (see Call Fiche)
Duration	max. 36 months	max. 36 months
Cooperation required	Yes	Yes
Total budget	EUR 1.000.000	open
Funding provider	BMK	Chinese Academy of Sciences
Submission deadlines for Joint Proposal and National Annexes	via FFG eCall: 13 May 2020, 11:00 C.E.S.T.	via CAS: 13 May 2020, 17:00 C.S.T.
Language	FFG Joint Proposal: English FFG Austrian Annex: English	CAS Joint Proposal: English CAS National Proposal: Chinese
Contact	Anita Hipfinger T: +43 (0)57755-5025 E: anita.hipfinger@ffg.at	Haihua Gong T: +86 (0)10 6859-7396 E: hhgong@cashq.ac.cn

Programme	FFG, ICT of the Future	CAS, Chinese Academy of Sciences
Information on the Web	FFG website to the call	CAS website to the call

The present Call Guidelines apply to the Austrian partners. They summarise information about the second bilateral call under the RTI Initiative 'ICT of the Future' and refer to the related call documents (in particular Technical Guidelines, application forms, Cost Guideline).

The call documents can be found at the FFG website related to the call

The full set of application documents must be submitted via FFG eCall by the submission deadline.

Please note:
If the application does not meet the formal requirements for project submissions in accordance with the conditions and criteria of the respective funding instrument and if the deficiencies cannot be corrected the application will be excluded from the further procedure and will be formally rejected without exception in accordance with the principle of equal treatment of applications.

2 Motivation

ICT of the Future is the funding programme of the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) for the promotion of challenging technology development and innovation in information and communication technology, interlinked with application areas and societal challenges. The programme supports ICT innovation in a comprehensive perspective. It aims to contribute to the goal of the federal government to bring Austria from the group of so-called Innovation Followers to the group of Innovation Leaders – to become one of the most innovative countries within the EU. The Community European Research Area (ERA) provides a frame of reference for this national programme, which will over its run-time complement both existing and new European initiatives within Horizon 2020.

This call of the RTI initiative 'ICT of the Future' will focus on the bilateral collaboration between Austria and China with the Chinese Academy of Sciences, CAS, in application-oriented research. The strategic aim of 'strengthening European and international collaborations and networks' will be addressed in particular.

Furthermore the Programme for Internationalisation of RTI Projects "Beyond Europe" supports Austrian companies, research and university institutes and other organisations in creating and extending collaborations. The Programme is open to all thematic fields. Funding is available for projects in all technical disciplines.

3 Objectives

The **strategic objectives** of the RTI initiative **'ICT of the Future'** are the following:

- **Develop lead technologies**
  - Increase both the quantity and the quality of ICT research and development that can achieve and sustain technological leadership.
  - Enable the exploration of new ICT research topics and application areas

- **Achieve lead positions in competitive markets**
  - Strengthen the capability of firms to innovate, support firms in establishing and extending their competitive position.

- **Establish and extend a lead position as a location for research**
  - Secure and improve Austria's visibility, interconnectedness and attractiveness in the international context in the area of ICT research and development.

- **Train and attract lead researchers**
  - Improve the availability of a sufficient number of trained researchers as the backbone of excellent ICT research and development.

4 Call Topics

The project must have its key focus on one of the Call topics listed below but may also address more than one of these areas.

1. Mastering complex ICT solutions: Systems of Systems
2. Conquering data: Intelligent Systems
3. Ensuring interoperability: Interfaces of systems

**1.	Mastering complex ICT solutions: Systems of Systems**

Future technological systems will exhibit capabilities to maintain their functionality even under duress, and while their environment is changing. As the complexity of computer systems rises, it becomes even more challenging to guarantee their correctness, e.g. by means of rigorous systems engineering. In such systems, the interaction of components can give rise to new, emerging properties at system level.

The research field **Rigorous systems** engineering concerns the research of new methods and tools to deal with issues such as fault tolerance, verification, validation, formal modelling and formal correctness. Important challenges exist in the certification of systems and subsystems for multiple requirements, and in the efficient use of multicore systems.

Adaptive systems are complex networks of distributed agents that are capable of adapting to changing conditions. Control of such a system is distributed, and its decisions and results are the outcome of interactions among individual agents. Research is necessary in adaptive control- and regulation systems as a precursor to smart, networked and highly parallelised Cyber-Physical Systems. This addresses also the development of novel architectures that simplify the evolution of existing systems.

Autonomous systems are useful for scenarios that are too dangerous or costly for human operators to enter. Autonomous systems possess a representation of both themselves and the world. They are able to perform tasks without supervision and to modify their behaviour in real time to accommodate unexpected situations or events. Large research questions remain in the fields of autonomy in vehicles and robot systems, ranging from novel hardware components to new programming paradigms.

2.   Conquering data: Intelligent Systems

The omnipresent spreading of mobile ICT-devices, the digitalisation of society, the possibilities of 5G and also other factors are catalysts for rapidly growing amounts of user-generated data. At the same time, more and more data is generated and exchanged between machines, e.g. in networks of sensors, or more generally through machine-to-machine communication (M2M). There is also a trend to make more data available to the public and to release data from still closed data silos.

Intelligent data management establishes the connection from raw data to information and knowledge. First and foremost this involves linking and exploiting existing and new data. This task goes far beyond pure search, and rather focusses on implementing innovative services and applications. Usage of new methods like Machine Learning and Computational Intelligence enable new applications.

Research on **Data analysis and integration** improves ways to process and analyse data in any format (e.g. images, video, audio, speech). Some challenges in this area are aggregation and fusion of multimodal or heterogeneous data, as well as novel, efficient and scalable methods for dealing with real-time data (stream) and data complexity and further on the resulting challenges of data extraction and data storage. There is an increasing demand for automatic video and image caption. A universal data management includes the connection from raw data to information and knowledge. The development of efficient algorithms is necessary to process a big amount of data in a short time. This efficiency can for example be provided by parallel algorithms, usage of graphics processing units (GPU), multicore parallel computing or by using shared resources with short load and execution time. Pseudonymization and anonymization must be considered where relevant.

Semantic processing adds structure to data in order to facilitate understanding of and dealing with structured data in multi-faceted ways. This extension of data with semantic information leads to content-level exploration and to automated processing. Special aims are to de-duplicate data by eliminating redundant data, and to use context information. This and a proper knowledge-extraction and –abstraction enable the **automation of knowledge processes**, including their more efficient, more cost-effective and more ergonomic design. Knowledge creation becomes more and more important also for data intense scientific research. The retrieval of semantic connections and the modelling of semantic connection-networks are of future significance. Another research topic is the improvement of the authentication of multimodal data based on collected background knowledge and considering e.g. privacy.

Cognitive systems model human understanding and human intellect and explore paradigms for cognitive technical systems. Particularly relevant for the programme are contributions to

applied cognitive science, e.g. for measuring, modelling and taking into consideration user attention in end user systems ("attention-aware computing"). In this context, video based attention detection, a technology approach which contributes to improving the knowledge transfer process, is relevant. Another recent field of research is deep learning, for example for video and image analysis – a research area that overlaps with data analytics. Algorithms for **prediction** from data (Machine Learning, Reasoning, Decision support) are also relevant, as well as advanced interface technology up to Brain-Computer-Interfaces.

3. Ensuring interoperability: Interfaces of systems

Ongoing digitalisation and strong collaboration in economic life leads to a higher added value, more wealth and a higher standard of living. On the other side, the dependence on information and communication technology (ICT) increases. These ICT-solutions can be obvious, if ICT-tools are used as soft- or hardware. However, the term "ICT-system" includes also ICT-supported systems, mechanisms and processes. The communication and interconnectivity between the components is necessary for the proper operation of these ICT-solutions.

The **Interface** is the part of a system that enables communication. It normally consists of soft- and hardware. Communication pathways do not only cover interfaces within software and within hardware, but also between the two, and not just for the current instant, but also for future, unknown communication partners. A careful development and choice of adequate interface concepts and of **technologies and tools for interfaces** is unconditionally required, in order to minimize friction losses between individual ICT components. New technologies can enable improvements of the information throughput. New methods of the interface design provide the flexible interaction of soft- and hardware (like electronics and photonics). Substantial technical challenges emerge often when legacy systems need to be integrated in new system environments.

Compatibility makes it possible for users to exchange products from different manufacturers freely and to use them in combination. As an example, in Ambient Assisted Living, different ICT systems in a household must continue to work seamlessly together while undergoing increasing automation, remote control and autonomy. ICT applications with demanding requirements on seamless interaction of components are becoming also more and more important for the provision of health care services with central and de-central medical diagnostics. Man-machine interfaces are equally of growing importance. From a national economic perspective, standardization is important – in particular, compliance with existing standards, as well as the establishment of new standards. It is noted that addressing activities for standardisation in the work packages is possible.

5 Requirements

5.1 General requirements for the Chinese-Austrian consortium

The requirements and procedures described in the 'Call Fiche' apply to the consortium. The following criteria must be met:

- The consortium shall consist of at least one partner from CAS Chinese Academy of Sciences and at least one Austrian partner.

- The consortium shall include at least one Austrian industrial partner.

- Individual enterprises account for a maximum of 70% of the eligible project costs with shares of affiliated companies counting as one enterprise.

- Companies share is a minimum of 20% and a maximum of 90%.

- The research institution(s) bear(s) at least 10% and a maximum of 80% of the eligible costs (relates to the total share of Austrian research institutions and CAS research groups). This applies to the entire bilateral consortium in deviation from the Austrian Technical Guidelines for Cooperative R&D Projects at a Transnational Level. Therefore as a matter of fact, Chapter 2.2 in the Technical Guidelines for Cooperative R&D Projects is not valid for this call.

- The research institution(s) shall be entitled to publish the results of the research carried out by the respective institution(s).

- The applicant must ensure that the bilateral projects submitted are not aimed at developing weapons or violence-promoting products. This provision must be specifically included in the Consortium Agreement. The payment of funding depends on compliance with this requirement.

- The applicant must ensure that the bilateral projects submitted are not aimed at gambling of any kind (i.e. games in which the outcome is determined exclusively or predominantly by chance). This provision must be specifically included in the Consortium Agreement. The payment of funding depends on compliance with this requirement.

- Any other commercial and/or export restrictions currently in place must be observed.

- A Consortium Agreement signed by all partners must be forwarded to FFG via eCall and to CAS Chinese Academy of Sciences prior to the preparation of the national funding agreement.

- The Joint Proposal must be submitted via FFG eCall by 13 May 2020, 11:00 C.E.S.T. Central European Summer Time at the latest.

- The Joint Proposal must be submitted to CAS Chinese Academy of Sciences by 13 May 2020, 17:00 C.S.T. China Standard Time at the latest.

- The Joint Proposal submitted to FFG and CAS Chinese Academy of Sciences must be identical. In the event of deviations, FFG reserves the right to reject the proposal for formal reasons.

5.2 National requirements for ICT of the Future

Bilateral cooperative research and development projects between Austria and China falling into the research categories 'Industrial Research' or 'Experimental Development' may only be submitted under this call.

The following requirements shall apply to submissions by Austrian participants to the RTI initiative 'ICT of the Future' **in addition to** the general requirements specified in chapter 5.1 above:

- the provisions of the Technical Guidelines for Cooperative R&D Projects at Transnational Level

- In addition to the Joint Proposal the Austrian national Annex must be uploaded via eCall. The application documents must be submitted via FFG eCall by 13 May 2020, 11:00 C.E.S.T. at the latest.

The following provisions apply in deviation from the Technical Guidelines for Cooperative R&D Projects at Transnational Level:

- The amount of funding requested by the Austrian partners must be between EUR 100.000 and EUR 1.000.000.

- The following requirements shall apply to the entire Austrian-Chinese consortium instead of the requirements specified in Chapter 2.2 of the Technical Guidelines:

  - the research institution(s) bear(s) at least 10% and a maximum of 80% of the eligible costs
  - Companies share is a minimum of 20% and a maximum of 90%
  - the research institution(s) shall be entitled to publish the results of the research carried out by the respective institution(s)
  - A Consortium Agreement signed by all partners must be forwarded to FFG via eCall prior to the preparation of the national funding agreement.

- The requirements specified in Chapter 2.2 of the Technical Guidelines shall be replaced by the requirement that at least **one Austrian company** must participate in the Austrian-Chinese consortium.

- The Chinese applicant and partners must be from one or more CAS research groups.

- Companies are eligible to apply if they have a permanent establishment or branch (according to Council Directive 2011/96/EU of 30 November 2011, in conjunction with Art. 11 (5) a GBER, No. 651/2014 of 17 June 2014) in Austria at the time of submission of the application and payment of funding.

  - Art. 2 (b): 'Permanent establishment' means a fixed place of business situated in a Member State through which the business of a company of another Member State is wholly or partly carried on in so far as the profits of that place of business are subject to tax in the Member State in which it

> is situated by virtue of the relevant bilateral tax treaty or, in the absence of such a treaty, by virtue of national law;
> - o Art. 3 (1) Definition of parent company and subsidiary

- Companies are eligible to apply if their main focus is on research and the exploitation of results is in Austria. Subsidiaries based in China may act as sub-contractors in the consortium, if required.

- The EUR-CNY conversion rate of the European Central Bank ECB at the date of submission shall apply. This can either be the reference date specified in the Joint Proposal or the conversion rate provided by the ECB on a monthly basis . The rate must be specified in the Joint Proposal. The conversion rate shall apply for the duration of the project and for all reports related thereto.

- The participation and financing of additional international partners in the consortium shall be excluded in this bilateral call in deviation from the provisions of the Technical Guidelines.

- Austrian partners and partners of CAS may cover their costs by own funds and/or grants provided by Austria or China. Partners from other countries shall be excluded from participating in the consortium. Organisations from outside Austria or China may be involved as sub-contractors of Austrian partners. FFG will check whether the Austrian project part is properly allocated to the research category of 'Industrial Research' or 'Experimental Development' based on the Joint Proposal. This may involve a reduction in the funding rate. BMK will take the funding decision for the Austrian project partners. CAS shall be responsible for the funding decision for the Chinese partners.

6 Call Documents

6.1 Joint call documents FFG – Chinese Academy of Sciences

Table 2: Overview Joint transnational call documents

Transnational documents	downloads
Call Fiche:	Joint call guidelines FFG and CAS
Application form (Joint Proposal):	Joint project description Austria – CAS

6.2 National call documents for FFG

The following national call documents for the 'ICT of the Future' programme shall apply in addition to the joint call documents:

Table 3: Additional documents for Austrian participants

National documents	downloads
National Guideline (present document):	RTI Initiative ICT of the Future, 2nd Call
Application form (National Annex):	Project description for transnational cooperative R&D projects Industrial Research or Experimental Development
Technical Guidelines:	for Cooperative R&D Projects at Transnational Level (Version 3.2)
SME Status	Declaration of SME Status (if required)
General cost regulations	Cost Eligibility in FFG Projects (Version 2.1)
Legal basis	Guideline Promotion of Industrial/Technological Research, Technology Development and Innovation (FTI-Richtlinie 2015-Themen-FTI-RL)

If there is no information available in the Austrian Business Compass (e.g. for associations and start-ups), a Declaration of SME Status must be provided upon submission of the proposal. In the template provided by the FFG, applicants must (as far as possible) categorise their business for the last three years according to the SME definition

Austrian applicants must submit both the Joint Proposal and the Austrian Annex via FFG eCall as part of the electronic application.

Applicants are requested to use the specific templates provided for the submission of their projects. The funding conditions, application procedure and funding criteria are described in the corresponding Technical Guidelines and in the transnational call documents.

The call documents can be found in the download centre on FFG website.

The cost plan has to be filled out via eCall. It must show the project costs broken down to work package level. This also applies to accounts rendered as part of the reporting process.

6.3 National call documents for Chinese Academy of Sciences

For the Chinese partners, further national call documents of CAS shall apply in addition to the joint call documents.

The Chinese partners will find more detailed information on the call and the relevant call documents on the national website of CAS.

7 Legal Basis

This Call is based on the RTI Guidelines for the Promotion of Industrial/Technological Research, Technology Development and Innovation (FTI-Richtlinie 2015 – Themen-FTI-RL).

The company size shall be established in accordance with the corresponding SME definition specified in EU competition law. More information can be found under SME definition on the FFG website.

All national and EU provisions shall be applicable as amended.

8 Additional Information

This section contains information about additional funding options and services which you may find useful in connection with funding applications or funded projects.

8.1 FFG Project Database

The public access FFG Project Database provides the opportunity to publish brief information about funded projects and an overview of the project partners involved. This enables you to present your project and your project partners to the interested public. The database can also be used to search for cooperation partners.

Once funding is granted, the applicants are informed via eCall that they can publish brief defined information about their project in the FFG Project Database. The information will only be published if active consent is given in the eCall system.

More information is available at the FAQ site to the FFG Project Database.

8.2 BMK Open4Innovation

The open4innovation platform of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) offers an additional knowledge base for companies and researchers (community support, detailed information, success stories etc.).

8.3 Handling project data – data management plan

A data management plan (DMP) is a tool that supports the efficient and systematic management of all data generated throughout the duration of a project.

DMPs can be created, e.g., using the free tool DMP Online. The "Guidelines on FAIR Data Management" of the European Commission also provide assistance in this respect.

A data management plan describes

- which data are collected, processed or generated within a project
- how these data are handled within the project
- what methods and standards are applied
- how the data are stored and updated over the long term and
- whether it is planned to make datasets available to third parties for reuse (i.e., open access to research data)

In the event of publication, the data should be "findable, accessible, interoperable and reusable". Storing data in established and internationally recognised repositories is recommended to ensure broad access.

9 Further Funding Options

FFG offers a broad range of funding options and support for the participation in international programmes. The following overview shows further international funding options related to this call. For further information please contact the FFG experts indicated below.

Table 4: Further funding options

international programmes	contact	link
ICT of the Future: ECSEL (Electronic Components and Systems for European Leadership)	Mag. Doris Vierbauch Telefon: 057755-5024 E-Mail: doris.vierbauch@ffg.at	www.ffg.at/ecsel
ICT of the Future: AAL – Active Assisted Living, Ageing Well in the Digital World	Dr. Gerda Geyer Telefon: 057755-4205 E-Mail: gerda.geyer@ffg.at	www.ffg.at/aal http://www.aal-europe.eu
ICT of the Future: ITEA 3 – europäische Schlüsseltechnologie softwareintensive Systeme	Irina Slosar Telefon: 057755-4901 E-Mail: irina.slosar@ffg.at	www.ffg.at/eureka_itea3
EUREKA, Profactory+ and Eurostars	Irina Slosar Telefon: 057755-4901 E-Mail: irina.slosar@ffg.at	www.ffg.at/programme/eureka pro-factory-plus.eu/
European Programmes	DI Thomas Zergoi Telefon: 057755-4201 E-Mail: thomas.zergoi@ffg.at	www.ffg.at/ikt/international
BEYOND EUROPE	DI Maria Bürgermeister-Mähr T: + 43 (0) 57755-5040 E: maria.buergermeister-maehr@ffg.at	https://www.ffg.at/en/beyond-europe

Imprint

Media owner, publisher and editor:

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Radetzkystraße 2, A-1030 Vienna

Responsible for the Programme:

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

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Version 1.0, Vienna 14.02.2020