

Applied Research and Communications • Fund •

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Annual Report

2018

Applied Research And Communications Fund 2018 Annual Report

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2018 Highlights

Innovation.bg has been ARC Fund's flagship initiative since 2004. It encompasses the *Innovation.bg* report, the *National Innovation Forum* and the *Innovative Enterprise of the Year contest*.

- The report *Innovation.bg 2018* presents the progress in the implementation of the national *Innovation Strategy for Smart Specialization* for the period 2014–2020, reviews the main challenges faced by national and regional authorities, and provides recommendations for better understanding of the process of entrepreneurial discovery and for improvement of the science–business relationships lying at its basis.
- *The National Innovation Forum (NIF)* is a platform for exchange of ideas and cooperation among the government, business community and research organizations. This year's National Innovation Forum gathered more than 250 policy-makers, researchers and business people to discuss Bulgaria's position in the smart policies for innovation-driven growth.
- *The Innovative Enterprise of the Year contest* is open to participants from all sectors of industry nationwide. The contest is recognized by the European Commission as a best national practice for promoting innovation-based development. Twenty-five out of over 100 companies from various sectors of the economy were shortlisted and a 17-member jury in which public authorities, funding organizations, the business and academia were represented selected the winners in eight areas of innovation impact. *Spesima Ltd.* was awarded for Market Leadership for reengineering universal robots from the automobile industry. *Comrade Cooperative* received the Social Innovation award for developing innovative software products on the basis of blockchain and artificial intelligence. Contest finalists also received ARC Fund's newly introduced „*Excellence in Innovation*” label for their cutting-edge innovations.

Innovation and business support

2018 was marked by Bulgaria's Presidency of the Council of the EU. ARC Consulting, as Coordinator of Enterprise Europe Network (EEN) – Bulgaria, co-organized key European business events and facilitated nearly 70 international negotiations of more than 40 Bulgarian companies. As a result of the integrated support, eight international agreements with Bulgarian companies were reached. During the year, more than 70 Bulgarian companies benefited from the consulting services and expertise of EEN.

ARC Fund also took part in a series of capacity building and interregional learning events with business and public institutions on improving the efficiency of national and European financial instruments for SMEs and innovations, bringing therein the National Innovation Fund and the Innovation Fund of Sofia Municipality.

Science, technology and innovation policy

In this area ARC Fund focused on: responsible research and innovation (RRI), transforming household energy consumption culture, developing research infrastructures, and building national capacities for research and innovation project management. ARC Fund completed a study of RRI in Bulgaria, which found that familiarity with the RRI concept is mostly limited to policy-makers and researchers familiar with EU funding programs. ARC Fund

examined and classified 1067 sustainable energy consumption initiatives and created an open-access online database for energy practitioners, researchers, community groups, and anyone seeking good practice examples. Bulgaria and the Danube region lack the capacity to evaluate, monitor and assess the socio-economic impact of research infrastructures. To tackle this deficiency, ARC Fund engaged in pilot mutual learning between research infrastructure managers from several countries in the Danube macro-region.

Safer Internet

In 2018, the Safer Internet Program further expanded its activities for protecting children online. The Internet Hotline for fighting illegal and harmful content and conduct online received and processed over 6200 reports on sexual exploitation online and was granted a Quality Certificate by the International Association of Internet Hotlines INHOPE. Over 2000 teenagers were trained under Safer Internet's most successful program Cyberscout and more than 3000 children, 1500 teachers, 1200 parents, 300 social workers and 250 university students were involved in various training and awareness raising events. The Ministry of Education joined the working group of ARC Fund experts, high school teachers and university professors set up to develop a methodology for teaching digital and media skills in primary schools. ARC Fund became Trusted Partner of Facebook and Trusted flagger of Google.

PART ONE:

PROGRAM AREAS

Innovation.bg

Innovation.bg is the flagship initiative of ARC Fund.

- The *Innovation.bg* report provides annual assessments of the Bulgarian economy's innovation performance and of the innovation system's current status and development prospects. *Innovation.bg* 2018 presents the progress in the implementation of the national Innovation Strategy for Smart Specialization (S3) for the period 2014-2020, reviews the main challenges faced by national and regional authorities, and provides recommendations for better understanding of the process of entrepreneurial discovery and for improvement of the science–business relationships lying at its basis. The report concludes that authorities at all levels of governance should target their efforts at improving the implementation of S3 to strengthen the impact of smart specialization on the national economy and make Bulgaria a moderate-innovator country.
- *The National Innovation Forum* is a platform for exchange of ideas and cooperation among the government, business community and research organizations. It enhances the performance of Bulgarian companies and boosts the innovation potential of the economy by promoting the introduction of new products and technologies and by facilitating business contacts with European partners. The Forum's policy agenda is based on the findings of the *Innovation.bg* 2018 report.
- *The Innovative Enterprise of the Year contest* is open to participants from all sectors of the industry nationwide. The award acknowledges innovative enterprises which have developed new, or have significantly improved their old products, services or processes over the last three years. In 2018, ARC Fund introduced the Excellence in Innovation label given to contest finalists to boost their visibility and recognition across boundaries.

Innovation.bg 2018



Innovation.bg is Applied Research and Communications Fund's overall program for shaping the national innovation policy agenda. It combines several components which offer expertise and policy advice.

Since 2004, the *Innovation.bg* report has been used as a tool, based on survey and micro-studies, for independent, comprehensive annual performance assessment of the national innovation system and the national economy. *Innovation.bg* applies an original methodology to assess the degree of business innovation activity based on the types of innovation and the degree of novelty of introduced innovation products and processes. Traditionally, the *Innovation.bg* report assesses Bulgaria's innovation po-

tential in five major fields:

1) Gross Innovation Product reviews the results of the national innovation system, the main innovation targets of the enterprises and the problems they face in their innovation activities.

2) Entrepreneurship and Innovation Networks outlines the characteristics of two major sources of innovation in the Bulgarian economy – the setting up of new enterprises and the participation of Bulgarian producers in national and international value chains for the development of new products and services.

3) Investment and Financing of Innovation considers the role of foreign direct investment and the import of R&D products and knowledge as well as the available instruments for R&D investment.

4) Human Capital for Innovation reviews the available human resources for the adoption of foreign and the creation of local innovation in the economy.

5) Information and Communication Technologies (ICT) analyses the existing ICT infrastructure as an R&D catalyst.

The *Innovation.bg* report provides valuable analytical framework and expertise for a number of stakeholder groups:

- European project partners, such as the Joint Research Centre, cited the re-

port's findings and recommendations with regard to the new trends of the process of smart specialization at European and national level.

- Central and regional authorities, including the Ministry of Economy, the SME Promotion Agency, the Ministry of Foreign Affairs, the Municipalities of Sofia, Gabrovo and Ruse, etc., use the analyses of the innovation capacity of the national and regional economies as a tool for rationalizing the decision-making process in the field of business support.
- The private sector and academic community acknowledge the good practices described within the report as an important benchmark.

The key topic of *Innovation.bg 2018* was the smart specialization concept and instrument introduced by the European Commission in 2013 – 2014 in order to allow Member States and their regions to draft their own development concepts based on the strengths of local businesses and to make better use of the European funds to be granted by 2020. Bulgaria had postponed the adoption of its Smart Specialization Strategy until 2016 when it was finally adopted and approved by the European Commission, although discussions on it with the Bulgarian government continued.

Regional Innovation Centers

At the insistence of the European Commission to encourage cooperation between business and researchers at the regional level and offset the concentration of Centers of Competence and Centers of Excellence in Sofia, the government has transferred BGN 100 million from the Science and Education for Smart Growth Operational Program (OP SESG) to the Innovations and Competitiveness Operational Program (OP IC) to fund the establishment of Regional Innovation Centers (at least one center for each ISSS¹ thematic priority in each of the six NUTS II regions in Bulgaria). To achieve sustainability, Regional Innovation Centers should be allied to innovative private companies or clusters in each region.

ARC Fund contributed to the development of the concept of the Regional Innovation Centers. It was commissioned by the Ministry of Economy to draw up recommendations based on focus-groups and stakeholder interviews across the country, and on an in-depth analysis of European good practices.

¹ Innovation Strategy for Smart Specialization (ISSS) of the Republic of Bulgaria

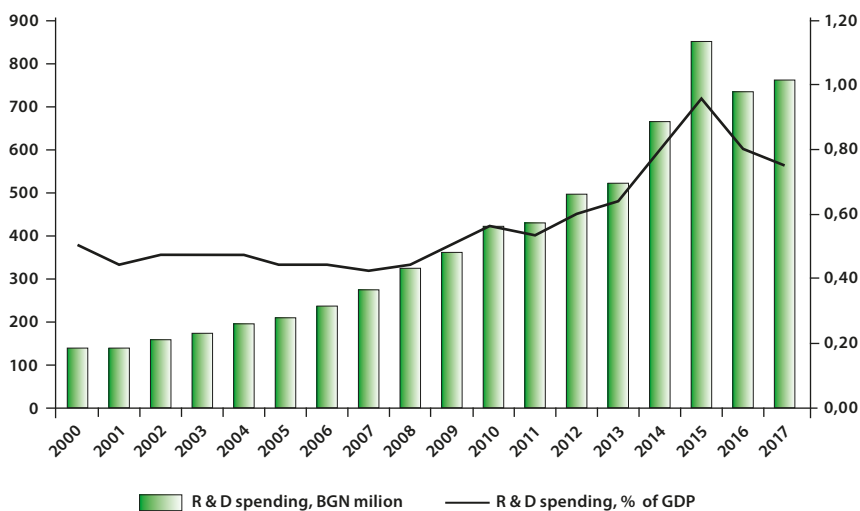
Analyzing the experience of the Sofia Tech Park, Centers of Competence and Centers of Excellence, the report concludes that the Bulgarian public and private sectors struggle to manage such a complex infrastructure even within the most developed region of the country –the capital Sofia. ISSS and its thematic priorities are hard to implement due to a number of strategic, managerial and financial obstacles. The lack of a sustainable mechanism for interfacing with innovative Bulgarian businesses is a main weakness hampering the improvement of measures and projects.

Smart specialization as a key EC tool for innovation support will keep its key importance after 2021. The task of the

Bulgarian government (central and local) is to come up with solutions for achieving a breakthrough in innovations and to raise growth levels above those of Central Europe and the Baltic countries.

Innovation.bg 2018 also points out that for a second year in a row, the share of R&D costs in GDP has continued to decline to 0.75%. The decline in the number of staff engaged in R&D is 3.4% year-on-year. In addition, over 67% of the population aged 16 to 74 do not have digital skills, compared to 41% on average for EU-28. Only 2% of the population is engaged in forms of lifelong learning, versus 11% on average for EU-28. A mere 31% of companies (66% for EU-28) fund on-the-job training programs.

Fig. 1. R&D spending in Bulgaria, 2000-2017.



Source: NSI, 2018

The bottom line is that, remaining stuck at the 2010 levels of several innovation potential indicators, Bulgaria forgoes a number of opportunities and ultimately lags behind the developed European economies and the new EU Member States. A breakthrough could be achieved in the next two years, when the technical and substantive aspects

of the strategic framework for the next programming period will be prepared. In addition, policies for smart specialization at the national and regional level should be designed and consistently applied in order to further enhance the input of the private sector into the innovation economy of Bulgaria.

The Fourteenth National Innovation Forum

For a fourteenth year in a row, the National Innovation Forum gathered more than 250 representatives of the policy, research and business communities to share views on Bulgaria's position in the smart policies for innovation-driven growth. The event took place on 6 December 2018.

Dr. Ognian Shentov, Chairman of the Applied Research and Communications Fund, highlighted the main challenges to unlocking Bulgaria's innovation potential, such as low innovation activity, shrinking public spending for innovation and research, and a declining number of researchers in public institutions. He also noted the growth of private investments in innovation,

but pointed out the need for long-term government commitment and support.

The President of the Republic of Bulgaria Mr. Rumen Radev stated that innovations are "the most effective way to achieve sustainable economic growth". He observed that despite competitive advantages such as young talent, growing private investments in R&D and easy access to broadband internet, Bulgaria is still among Europe's modest innovators. The President expressed his support for comprehensive policy measures and incentives for innovations, targeted funding programs, investments in education, and lower administrative burden.



President of the Republic of Bulgaria Mr. Rumen Radev at the 14th National Innovation Forum



(L–R): Dr. Ognian Shentov, Chairman of ARC Fund; Mr. Rumen Radev, President of Bulgaria; Ms. Karina Angelieva, Deputy Minister of Education and Science



14th National Innovation Forum, Sofia, 8 December 2018

The 2018 Innovative Enterprise of the Year National Contest

Since 2004, **Innovative Enterprise of the Year** awards have been given to Bulgarian companies successfully integrating innovations or scientific achievements in their practice and thus streamlining their

activities and improving their long-term performance. Companies are assessed following a specific methodology by an expert group and an external jury by area of impact of the innovation.



President of the Republic of Bulgaria Mr. Rumen Radev (middle), Dr. Ognian Shentov, Chairman of ARC Fund (left) and award winners of Innovative Enterprise of the Year 2018

Twenty-five out of 100+ companies from various sectors of the economy were short-listed and a 17-member jury, in which public authorities, funding organizations, the business and academia were represented, selected the winners in the eight areas of in-

novation impact. President Radev presented the awards to the **winners in the national contest Innovative Enterprise of the Year 2018**.

Spesima Ltd. was granted the award for



President of the Republic of Bulgaria Rumen Radev and Ivana Slavkova and Svetoslav Savkov, Spesima Ltd.

Market Leadership for reengineering universal robots from the automobile industry and successfully selling them in over 35 countries. The company uses the robots' mechanic construction, and develops and equips it with new hardware and software, thus transforming its application to an entirely new one. The approach is ecological and energy-saving.

Innovation award for developing innovative software products based on blockchain and artificial intelligence. Founded by 16 cooperators, the company has created the blockchain infrastructure Wetonomy, used for the management of autonomous organizations via smart contracts. They have also developed the blockchain platform Scynet for creating and training artificial intelligence.

Comrade Cooperative received the Social



President of the Republic of Bulgaria Rumen Radev and Todor Kolev, Comrade Cooperative

Introducing the Excellence in Innovation Label



The Innovative Enterprise of the Year contest finalists also receive ARC Fund's newly introduced **Excellence in Innovation label** in recognition of their cutting-edge innovations. An independent jury of experts assesses them by a set of indicators such as high quality and originality of innovations, impact on national and world markets, the environment and society, and efficiency of the business model.

Innovation and Business Support Program

In 2018, the Innovation and Business Support Program focused its activities in the following fields:

- **Supporting SMEs to establish international partnerships and enter markets in third countries.** 2018 was marked by Bulgaria's Presidency of the Council of the EU. ARC Consulting as Coordinator of Enterprise Europe Network (EEN) – Bulgaria co-organized key European business events on the Network's calendar and facilitated nearly 70 international negotiations of more than 40 Bulgarian companies. As a result of the integrated support, eight international agreements with Bulgarian companies were signed in 2018.
- **Consulting SMEs.** There were three main areas of interest among businesses: Access2Finance, focusing on the SME Instrument within Horizon 2020; access to new markets; and innovation management. More than 70 Bulgarian companies benefited from the services and expertise of EEN in these areas. With the support delivered, four SME projects were developed and submitted to the H2020 and LIFE programs, one of which was awarded a grant contract under the SME Instrument. ARC Consulting experts are among the few in Bulgaria licensed by the IMP³rove International Innovation Management Academy. Nearly 30 SMEs approached ARC Consulting and benefited from In-depth IMP³rove analysis and consultations, resulting in optimized management of their innovation processes.
- **Efficiency of financial instruments for SMEs and innovation.** In 2018, ARC Fund took part in a series of capacity building and interregional learning events with business and public institutions on improving the efficiency of national and European financial instruments for SMEs and innovations, involving the National Innovation Fund and the Innovation Fund of Sofia Municipality. Measures and recommendations were drawn up in Action Plans based on internationally recognized good practices and on the assessment and opinions of experts, stakeholders and partners from Austria, Spain, Portugal, Italy, Poland, France, Spain, Germany and Estonia.

Assisting SMEs with International Partnerships and Entering New Markets

EEN – Bulgaria, coordinated by ARC Consulting, offered to Bulgarian companies new opportunities for access to finance, international partnerships and entering markets in third countries.



In the year of its Presidency of the Council of the EU, Bulgaria was in the spotlight in terms of promoting growth, competitiveness and innovation.

TCI’s Sofia conference broadened the debate about EU cluster policy

In partnership with EEN at ARC Consulting, on March 20-22 the global practitioners’ network for competitiveness, clusters and innovation TCI held its 2018 annual conference in Sofia entitled “Turning challenges into opportunities through clusters in South Eastern Europe”.

Despite its regional focus, the conference brought together delegates from more than 20 countries, including New Zealand and Canada. Participants discussed the way clusters can become drivers of broader change in local competitiveness and the right approach to achieving greater impact, while remaining anchored in cluster dynamics and regional context. Some of the notable conference speakers were Ulla Engemann, Head of the Advanced Technologies, Clusters and Social Economy Unit at DG GROW, Madeline Smith from the Institute of Design Innovation at Glasgow School of Art, and Alberto Pezzi from ACCIÓ-Catalan Government.

WATIFY: Inspire to Transform in Sofia stimulated the technological transformation of European business

Digitalization was one of the EU priorities on the Bulgarian Presidency agenda. Core to this campaign was **WATIFY: Inspire to Transform**, an interactive high-policy profile event of DG GROW, co-organized by ARC Consulting and EEN Bulgaria on May 2. EEN also partnered in the high-level conference on “Smart Specialization and Technology



TCI annual conference with delegates from more than 20 countries, Sofia, 20-22 March 2018

Transfer as Innovation Drivers for Regional Growth” on May 3-4.

WATIFY brought together innovation leaders and policy-makers from across Europe, amongst which Malina Edreva, Vice President of the European Committee of the Regions Bureau, and Markku Markkula, First Vice-President of the EU Committee of the Regions. Particular focus was placed on the creation of intelligent communities where citizens empower each other with innova-

tion-driven societal solutions. The event provided opportunities to pitch projects and ideas and to exchange experience with innovative European SMEs that showcased on site their technological transformations. **SmartFabLab**, the first digital fabrication laboratory in Bulgaria, presented the making of prototypes with a 3D printer, demonstrating the printing of the WATIFY Award live. **Bächer and Bergmann** won the 2018 award for the best WATIFY technological transformation.

Bulgarian innovators and entrepreneurs shared success stories on the National Radio

For a second year in row, the Enterprise Europe Network at ARC Consulting publicized a program specifically dedicated to innovation via the Bulgarian National Radio. Bulgarian innovators and entrepreneurs talked about their challenges and achievements in a series of broadcasts organized in partnership with the International Business School, Sofia and Botevgrad. The program featured ARC Fund senior expert **Dr. Todor Galev**, who pointed out that Bulgarian SMEs outside the ICT sector are 3 times less digitalized compared to the EU average. Their poor performance or market failure are often due to the lack of long-term strategy, vision and market insight. In counterpoint, Innovative Enterprise of the Year contest participants shared their success stories, such as smart

technologies for optimized waste management, specialized car services for people with disabilities and mothers with children, and a social network where volunteers, NGOs and businesses join in to build social responsibility. Another major challenge entrepreneurs face is the lack of skilled labor force. Interaction between the educational system and business should be enhanced and the education process should encourage students to create sustainable businesses. As put by **Prof. Teodora Georgieva**, education is complementary to the development of the innovation environment. It is important to link the support of family, state, business and education entrepreneurs, so that the educational system does not remain an island.

Consulting SMEs

In 2018, 35 SMEs and newly established companies benefited from ARC Consulting's integrated services covering Access-2-Finance, IPR, and Innovation Management, access to new markets, innovation and tech-transfer brokering. As a result, four project proposals by Bulgarian SMEs and clusters were submitted under the *Horizon 2020* and *LIFE* programs, addressing challenging issues such as the capacity of banks and other investors to evaluate energy efficiency projects, new methods for beekeeping and biodiversity preservation, and new legislations in bioenergy in the EU regions. An innovative marine technology designed by a Bulgarian SME was granted financial support by *H2020* and is currently tested in diverse aqua environments. The support to Bulgarian companies' participation in specialized brokerage events and business missions such as **Digital Health B2B** in Bristol and **Chii 2018**, and in the interactive EEN database, triggered more than 65 negotiations on business and technological partnerships in a variety of sectors such as digital and creative technologies, construction, metal processing, environmental protection and ICT outsourcing. In 2018, the

SME support achievements led to eight successful partnerships and entries on EU and third-country markets, amongst which Ger-

IMP³rove

many, Romania, and Montenegro.

During the year, ARC Consulting was entrusted by EASME to act as EU IPR Helpdesk Ambassador for Bulgaria. ARCC hosts three senior experts, among the very few in Bulgaria, licensed to consult SMEs using assessment tools by the ATKerney Innovation Management IMP³rove Academy. The Innovative Enterprise of the Year contest with its Innovation Management IMP³rove-based award category were recognized a good practice and accepted as part of the Interreg Europe Program repository of good practices. ARC Consulting is one of the four organizations in Bulgaria authorized by the European Commission to act as Key Account Manager (KAM) to SMEs awarded a grant contract under the *H2020* SME Instrument.

Leveraging policy efficiency

Under the **Effective Financial Instruments in Support of SMEs** initiative, eight European regions from Poland, France, Spain, Germany, Estonia and Bulgaria have joined efforts to analyze the challenges to effective SME support, in particular, the mechanisms for monitoring and evaluating SME support instruments. ARC Fund was commissioned by the Bulgarian SME Promotion Agency to assess the National Innovation Fund and develop an Action Plan for improving its efficiency and impact. The key challenge to the Agency as the Fund's managing authority was found to be the lack of monitoring

mechanisms ensuring the sustainability and impact of the invested financial support.

ARC Fund launched public consultations with representatives of innovative businesses and institutions titled "Business opinion matters". The views and ideas shared in the discussions are translated by ARC Fund into an Action Plan with a set of improvement measures. The policy initiative was selected and showcased as a good practice at the pan-European Interreg Europe Experience Fair in Sofia within the Bulgarian Precedency of the Council of the EU in the first half of 2018.

InnoBridge brings together European regional practices to make research and innovation a market success

Another eight European regions work under the **InnoBridge** initiative which aims to make research and innovation a market success and leverage the efficiency of policy and financial instruments that support the transformation of R&D results into commercial assets. ARC Fund is the methodology and process advisor to the group. In 2018, ARC Fund together with Lower Austria's regional

government, designed and facilitated interregional learning workshops in Krakow, Bolzano and Baden to foster new ideas of mid and long-term measures to feed into Improvement Action Plans. The InnoBridge Concept Paper summarizes the approach and the lessons learnt and provides policy recommendations to the EC and the participant regions.



Interregional Learning Workshop, Baden, Austria, 27 November 2018

InnoSupport initiative for enhancing the SMEs competitiveness of FYROM

In 2018, ARC Fund was commissioned by the Ministry of Finance of Republic of North Macedonia to transfer knowledge, experience and good practices to the local SMEs and enhance their innovation-driven competitiveness. ARC Fund made the research editorial and finalization of the guides on *Basic Tools To Support Innovation In SMEs* and *Innovation Financing*, drafted by the Youth Entrepreneurial Service Foundation and the Foundation for Management and Industrial Research.

On 20-21 September, a capacity building workshop on „Financing of research and innovation projects through the EU program Horizon 2020” was held in Skopje. ARC Fund trained young entrepreneurs from 30 local SMEs to draft H2020 project proposals. The workshop focused on R&D&I results, intellectual property and protection, as well as on the specifics related to their dissemination, transfer and licensing. ARC Fund shared its experience in innovation project management under H2020 in several practice-oriented sessions.



H2020 training, Skopje, 20-21 September 2018

The local partners were welcomed to the National Innovation Forum and the Innovative Enterprise of the Year 2018 contest to get deeper insight to the process of entrepreneurial discovery. As a follow-up, ARC

Fund was assigned the development of a roadmap for transferring the methodology of the Innovative Enterprise of the Year national contest in 2019.

Science, Technology and Innovation Policy Program

The Science, Technology and Innovation Policy Program of ARC Fund is involved in public debates on the challenges faced by research and innovation stakeholders. It mobilizes actors from civil society, business, universities and research organizations, as well as policy and decision-makers, towards a shared understanding of forthcoming transformations and challenges in technological developments and innovations, and steers them towards a shared vision for the integration of responsible research and innovation principles into science and policy-making. In 2018, the program focused on:

- **Advancing responsible research and innovation**

In 2018, ARC Fund completed a year-long study of the current state of and trends in RRI in the Bulgarian science, research and innovation landscape. The study confirmed that the RRI concept remains largely unknown beyond the community of policy-makers and researchers thoroughly familiar with EU funding programs. On the other hand, it noted that this community is growing both in terms of size and in scope of action – a process ARC Fund has successfully promoted and encouraged.

- **Transforming household energy consumption culture and raising energy consciousness of consumers**

ARC Fund, supported by several of its partners, examined and classified 1067 sustainable energy consumption initiatives, creating an open-access online database as an invaluable resource for energy practitioners, researchers, community groups or anyone seeking good practice examples of energy initiatives from all over Europe. Bulgarian households were found to be active participants in top-down initiatives, but much less willing to self-organize and cooperate with their neighbors and fellow citizens.

- **Developing research infrastructures**

Insufficient capacity to evaluate research infrastructures (RI), monitor their operation, and assess their socio-economic impacts is a common problem for most countries in the Danube region, including Bulgaria. ARC Fund took part in a pilot initiative on mutual learning between research infrastructure managers from several countries in the Danube macro-region. It also contributed to the setting up of a Registry of research infrastructure reviewers, with 192 experts from the region already approved for inclusion.

- **Building national capacities for project management of research and innovation projects**

In 2018, ARC Fund performed an in-depth analysis of national capacities for research and innovation projects in the countries of the Danube macro-region. A persistent issue in all countries is the decoupling of scientific excellence from project management, with either one or the other taking precedence in the working practices of both researchers and project managers. In an effort to alleviate that gap, ARC Fund contributed to the design of a comprehensive pilot course on the management of research and innovation projects tested with 25 young project managers from the region.

Advancing Responsible Research and Innovation

Responsible research and innovation (RRI) is an important policy concept, having emerged in recent years as a framework to address grand societal challenges through the wider engagement of societal actors in the field of science and innovation. Most of the RRI keys (ethics; societal engagement; gender equality; open access; science education) have long been incorporated into the research practice in the country.

In 2018, ARC Fund successfully completed two large-scale citizen engagement based initiatives, drawing valuable policy lessons. These demonstrated the potential of involving citizens in discussions on topics that are traditionally the domain of science – i.e. nanotechnology, food security, bio-economy, and sustainable futures. The findings were presented to policy stakeholders from the European Commission and informed EU policies on responsible research and innovation, whereby citizen engagement is a core pillar. ARC Fund further strengthened its capacity to deliver sound methodologies that focus on the study of interfaces between science, society and public policy, and delivered strong evidence for the importance of considering citizen input as a valid knowledge source.

ARC Fund also studied the current state and trends in RRI in Bulgaria. The concept of RRI is mostly known among policy-makers and researchers professionally engaged with EU funding programs. However, individual RRI keys are well embedded into the research practice in the country, and debates related to the RRI principles have steadily grown in prominence within the science and innova-

tion community in Bulgaria. This is apparent from deliberations on the social impact of scientific research, debates on ethics and institutionalization of ethical norms (ethics commissions, codes of conduct for research integrity), initiatives to promote open science and open access policies, and increased attention to different methods for societal engagement. The legal framework on RRI, however, lags behind leaving it to public research organizations and universities to elaborate their own internal regulations related to RRI principles.

Responsibility in research and innovation is interpreted by policy-makers and by the research funding institutions like the Ministry of Education and Science and the National Science Fund as a need to address societal challenges and provide solutions to pressing social needs. This would mean that funding priority should be given to those research-performing institutions which produce results useful to society. Responsibility is also associated with accountability and an open and honest dialogue between all stakeholders involved in the research and innovation system.

For ARC Fund as a research institute, responsibility is embedded in the principles of good governance, financial accountability, adherence to high ethical and professional standards, commitment to public accountability, openness and collaboration, efficient management of resources, operational and financial autonomy, equitable and transparent stakeholder engagement, and moral integrity.

Transforming Household Energy Consumption Culture and Raising Energy Consciousness of Consumers

Climate change is becoming a critical issue, but the current pace and scale of change is not sufficient to achieve the necessary sustainability transitions in the energy systems

of European countries. In line with the European Commission' efforts to promote its climate and energy targets, ARC Fund played a major role in the extensive mapping of

sustainable energy consumption initiatives in European countries. ARC Fund surveyed and described several hundred community initiatives in 11 European countries through which households try to decrease their energy consumption and mitigate its negative impact on the environment.

Overall, ARC Fund and its partners have examined and classified 1067 sustainable energy consumption initiatives, creating an open access online **database** which informs users about their content, scale and objectives and assesses the attitudes to the challenge of excessive energy consumption. The database and interactive map are an invaluable resource for energy practitioners, researchers, community groups or anyone seeking good practice examples.

ARC Fund has also conducted a **study** of energy consumption tendencies, energy markets and energy policies in 11 European countries: Austria, Bulgaria, Cyprus, Estonia, Greece, Latvia, Lithuania, Poland, Romania, Spain, and Sweden.

The study on Bulgarian sustainable energy consumption initiatives revealed that 19 out of 45 examined initiatives attempt to change the energy consumption behavior of individual households or household members, while 14 projects aim at energy savings via various technological solutions. A few initiatives offer more complex solutions that necessitate the active involvement of a community of people who do not necessarily know each other, willing to (inter)act for the common good, rather than merely for pri-

vate energy saving purposes.

Most of the initiatives implemented in Bulgaria (32) are part of international projects, primarily funded by the EU. There are only a few grassroots projects, which shows an eagerness to participate in top-down initiatives, and a reluctance to self-organize and cooperate with neighbors and fellow citizens.

In 2018, ARC Fund, in partnership with an international team of energy experts, developed the ECO2 online training platform covering five thematic areas: limiting the carbon footprint of the house and its appliances; using and understanding ICT energy equipment; understanding energy language and energy bills; avoiding new energy consuming habits; and producing one's own energy. The platform raises consumers' awareness of their energy efficiency, so they could take steps towards improving it.

ARC Fund prepared a detailed overview of energy consumption and energy consciousness in Bulgaria based on previous studies in the field and on interviews with experts in energy efficiency and responsible energy consumption. An unpalatable conclusion of the report was that a great many Bulgarians seem indifferent or ignorant to the means and ways of saving energy at home. The report recommended organizing activities and trainings targeted at households and motivating them for responsible energy consumption. The ECO2 e-learning platform could be an efficient instrument in this regard.

Developing Research Infrastructures

Insufficient capacity to evaluate research infrastructures (RI), monitor their operation, and assess their socio-economic impacts is a common problem for most countries in the Danube region, including Bulgaria. ARC Fund joined the regional partnership in an effort to strengthen the capacity of the regional RI policy-makers, RI managers and RI evaluators.

The major activity organized by ARC Fund in 2018 was the preparation, organization and implementation of trainings to build **capacity** for evaluation, planning, monitoring and management of research infrastructures. The three training events took place between February and May 2018 in Sofia, Banja Luka and Bucharest, and were attended by more than 100 policy-makers

from RI program owning and funding authorities, active RI operators and coordinators, and potential or active RI reviewers from 14 Danube region countries (Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia and Ukraine).

ARC Fund was also responsible for setting up a Registry of research infrastructure reviewers to be used primarily by ministries, financing authorities, agencies in charge of RIs, and research organizations planning RI investments. In September, 192 experts were approved for inclusion in the Registry.

The partnership developed guidance documents on ex-ante assessment, on monitoring, and on the assessment of the socio-economic impact of RIs, as well as recommendations for policy-makers and

for research infrastructure managers. ARC Fund moderated a working group on socio-economic impact assessment, and coordinated the preparation of the *Guidance Document for Assessment of the Socio-Economic Impacts of Research Infrastructures*.

ARC Fund was involved in mutual learning between research infrastructure managers from several countries in the Danube macro-region. The peer learning teams participated in two-day fieldwork, conducting interviews and attending the laboratories and other research infrastructure of the host institution in the respective partner country. Using the “critical friend approach”, the teams prepared specific recommendations to the host RI. ARC Fund experts were part of a team which visited the Faculty of Civil Engineering in Rijeka, Croatia.

Building National Capacities for Project Management of Research and Innovation Projects

In 2018, ARC Fund performed an in-depth analysis of national capacities for research and innovation projects in the countries of the Danube macro-region, which focused

on the skills of project managers, on current abilities of organizations to carry out such projects, and on the availability of training opportunities in relevant knowledge areas. The



The participants in the first training within the initiative Excellence-in-ReSTI, Eisenstadt, Austria, October 2018

analysis revealed major differences, and a few similarities, between the countries in the region which are already members of the EU (with some internal differences still evident), and those which are associated countries. The surveyed practitioners throughout the region share the view that project management excellence is a double-layered concept with a significant impact on project success. On the one hand, excellence is seen as the high-quality scientific foundation of the project; on the other hand, it is an important trait of project outputs, which need to be timely, of high added value (i.e. of benefit to the public), and compliant to scientific standards. However, an issue common to all countries is the decoupling of scientific excellence from project management, with

either one or the other taking precedence in the working practices of both researchers and project managers.

To bridge this gap, ARC Fund contributed to the design of a comprehensive pilot course on the management of research and innovation projects. Based on its successful track record of involvement with such projects, the team developed a module offering a thorough overview of the rules and procedures for applying for EU funding through the major research and innovation programs – *Horizon 2020* and *Interreg Danube*. ARC Fund also facilitated the recruitment of Bulgarian trainees into the cohort of 25 individuals from the Danube macro-region who were trained and provided feedback about the pilot course.

Safer Internet Program

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In 2018, the Safer Internet Program enlarged the scope of its activities in the field of protection of children online. The Internet Hotline for fighting illegal and harmful content and conduct online received and processed more than 6200 reports on sexual exploitation online and was granted a Quality Certificate by the International Association of Internet Hotlines INHOPE. Over 2000 teenagers from across the country were trained under its most successful program Cyberscout. More than 3000 children, 1500 teachers, 1200 parents, 300 social workers and 250 university students were involved in training and awareness raising events. The Ministry of Education and Science joined the working group of ARC Fund experts, professional teachers and university professors, set up to develop a methodology for teaching digital and media skills in primary schools. ARC Fund's active and successful work for promoting children's safety online raised its international visibility making it Trusted Partner of Facebook and Trusted flagger of Google.

ARC Fund has been implementing the EC Safer Internet Program in Bulgaria for 14 years as coordinator of the Safer Internet Centre with its three components: Awareness node, Internet Hotline for reporting illegal and harmful to children online content and conduct, and the national Helpline for consulting children, parents, teachers, social workers and other professionals on issues concerning children's safety online. The Centre is member of the International Association of Internet Hotlines (INHOPE) and of the European Network of Safer Internet centres (Insafe) and is Bulgaria's representative in the EU Kids Online and Global Kids Online research networks. An ARC Fund expert was invited by UNICEF Innocenti to co-author a global report about children on the Internet.

The organization operates a Hotline for reporting online content that is illegal and harmful to children and supervises a Helpline operated by its partner Parents Association. The Hotline reports about online sexual exploitation of children are verified and transferred for further legal action to the national Cybercrime Unit. Via the Hel-

pline, trained psychologists consult children, parents and teachers about problems and incidents with children on the Internet.

In 2018, the Hotline received and took necessary actions on more than 6,200 reports, while the Helpline provided close to 400 consultations on various issues ranging from cyberbullying to security settings and use of the Internet and digital devices by minors. In 2018, the Internet Hotline was awarded INHOPE's Quality Certificate for its successful work and cooperation with the other INHOPE member hotlines, the national LEA and Interpol.

Besides the direct protection and support of children facing online risks and involvement in a number of research projects in the field of online safety and victimization of children and young people, ARC Fund has developed and has been implementing various educational methodologies for prevention of cybercrimes and online abuse of children. ARC Fund coordinates a working group of primary school teachers, university professors and representatives of the Ministry of Education and Science set up to

develop a methodology which also includes 10 modular lessons for teaching digital and media competences to primary school children based on the formal curricula. The lessons were piloted in dozens of schools and based on the feedback collected and the evaluation of the program the working group developed a holistic concept for teaching digital and media literacy from 1st to 12th grade for the Ministry of Education and Science.

In the last 4 years, ARC Fund has been running the Cyberscout training program which was ranked 9th in Europe by the European Crime Prevention Network in 2017. Being recognized as a center of excellence in the field of child protection on the internet, ARC Fund participates in various national and international activities and working groups for developing strategies and proposals for necessary legislative measures, social service procedures and practices. It conducts a regular basis training of children, teachers, parents, care givers, and social workers and is involved in various awareness raising activities. Experts from ARC Fund were included in an international working group formed by the European Crime Prevention Network to prepare a more structured and evidence-based strategy for the preven-

tion of crimes against children. ARC Fund participates on a regular basis in working and training meetings of the Radicalization Awareness Network presenting its expertise and sharing knowledge and practices with other organizations. ARC Fund also became Trusted Partner of Facebook and Trusted Flagger of Google.

Intervention and support in cases of incidents and risks for children online are important priorities, but the Safer Internet Centre places a major focus on prevention. To this end, in 2018 it trained over 3000 children, 1500 teachers, 1200 parents, 300 social workers and 250 university students.

The Cyberscout training program for children aged 11-12 has become highly popular in schools. In 2018, the ARC Fund trained over 500 children from 28 schools in 16 cities and towns. The trained children were invited to participate in a national competition among all trained cyberscouts by organizing various activities and initiatives among their peers to transfer the newly acquired knowledge and skills. Through these activities supported by a teacher they could reach to more than 2000 other children. The program's outreach was proved by more than 50 requests for trainings for 2019 from



Certification of cyberscouts in the city of Dobrich



Pupils in 55 schools across the country participated in the lessons on digital and media literacy in February and March 2018

all over the country. The results of the training are acknowledged by teachers and pupils alike. As one teacher put it: “Our trained pupils are very enthusiastic and put a lot of effort in the preparation of various awareness raising activities targeting their peers. They feel very proud to be cyberscouts and to teach other children how to prevent risks on the Internet”.

As the age of first-time use of the Internet has been constantly decreasing, ARC Fund started developing a methodology for primary schools for early development of digital and media literacy. The dedicated working group first developed a handbook for teachers with lesson plans based on the obligatory curriculum with a special emphasis on interactive work and specific digital and media skills. The methodology was presented at the national conference “How to Teach Media Literacy at School – Methods and Practices”, which took place in Sofia on 10 November 2018 and gathered representatives of the Ministry of Education, the Friedrich Naumann Foundation and the Bulgarian Fulbright Commission. More than 80 teachers from all over the country took part in interactive workshops and, as a follow-up, developed their own lesson plans based on the methodology.

In 2018, ARC Fund enhanced its cooperation with universities to train future teachers

and social workers on online risks for children and ways and methodologies for prevention. Students from universities in Sofia, Ruse and Blagoevgrad were trained and a formal cooperation agreement was signed with the Sofia University.

In February and March 2018, ARC Fund and the Coalition for Digital and Media Literacy at Schools launched the Media Literacy Days 2018 campaign, raising awareness about the concept of a continuous development of digital and media literacy from 1st to 12th grade. ARC Fund started the coalition in late 2017 and since then it has expanded to 15 member organizations. During the campaign teachers from 55 schools in 36 towns, cities and villages in Bulgaria conducted lessons on digital and media literacy using lesson plans and presentations developed by ARC Fund. A total of 4259 students participated in the campaign. Many of the schools also organized meetings with parents in order to familiarize them with the five main components of digital and media literacy: online safety, information assessment, communication and cooperation, content creation and problem solving. “The students were very proactive. They were enthusiastic that they could write the principles of digital competence on their own”, said Elka Radeva, a teacher at Sofia’s Zahari Stoyanov Primary School, also com-

Part one: Program areas

mending the campaign for being related to children's everyday practices. They shared their own experiences with Internet-related problems and recognized the importance of knowing more about online safety.

All activities aimed at children's online protection were widely covered by the media.

During the year, ARC Fund raised public awareness and gave advice for online risks prevention through more than 70 publications, 20 interviews and 16 live radio and TV appearances. The weekly program Liter@te broadcast on Bulgaria's popular bTV featuring ARC Fund experts attracted large audiences.

PART TWO:

MANAGEMENT

Institutional Development

ARC Fund is a not-for-profit organization acting for the public benefit. Up to 2017, ARC Fund was registered at the Sofia City Court and the Central Register of Not-for-Profit Legal Entities at the Bulgarian Ministry of Justice. In 2018, following amendments to the national legislation, ARC Fund was re-registered in the public Commercial Register and Register of Not-for-Profit Legal Entities at the Registry Agency under the Minister of Justice. Not-for-profit legal entities acting for the public benefit are obliged by law to conform to a number of additional rules, inter alia, to draw up and submit annually an activity report and financial statements for entry in the public Register.

In 2006, ARC Fund established ARC Consulting EOOD – a wholly-owned company designed to better leverage the organization's expertise. The company provides consultancy services in the field of innovation and ICT. It also develops and implements national and international projects under the EU Framework Programs for research, technology development and demonstration projects, and under the Cohesion and Structural Funds.

ARC Fund and ARC Consulting form the ARC Fund Group.

In 2018, the ARC Fund Group's employed full-time a staff of twenty-eight and a number of part-time consultants and advisors. The ARC Fund Group team is a mixture of young, well-educated and highly motivated people and experienced experts renowned for their professionalism and high quality work.

ARC Fund is managed in accordance with the principles of good governance, accountability and transparency. These principles are applied through:

- execution of annual audits since 1992;
- individual project audits;
- publication of Annual Reports in Bulgarian and in English;
- regular updates of the organization's website to inform the public about ongoing projects and events;
- child-protection policy, which contains an ethical code, principles and rules for working with children;
- publications in the media to enhance the impact of policy recommendations and increase public awareness of supported causes.

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PART THREE

FINANCIAL REPORT

