

# INFORMATION AND COMMUNICATION TECHNOLOGIES AND A GREEN ECONOMY\*

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**Abstract:** *The concept of «green economy» is urged to provide more harmonious coordination of components of economy, society and the nature within a paradigm of a sustainable development. At the moment it becomes a global course of innovative, anti-recessionary formation in many countries and regions of the world. One of global tendencies of «green economy» is the development of information infrastructure.*

**Keywords:** *Green economy, Information and communication technologies, influence*

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## INTRODUCTION

Information and communication technologies (ICT) become an important factor of modernization of society every year, influencing socio-economic indexes. Upon transition to «green» economy the special attention is paid to formation of the modern information infrastructure having key value for providing a sustainable development and modernization of economy. According to experts, construction of new information infrastructure – one of global tendencies of «green economy». In a number of EU countries «green» measures in the sphere of development of information infrastructure are developed. Development of digital and «green» economy is according to a number of the international institutes and organizations (International institute for sustainable development, Digital Economy Policy Group (DEPG), The Organisation for Economic Co-operation and Development (OECD)) synergetic connected and there is a need of new approaches of management for their effective interaction.

## THE INFLUENCE OF ON THE «GREEN ECONOMY»

The opinion [1,2,4,5] is created that the sector of ICT can influence development of «green economy» by three main ways:

1. Direct influence (the first level) - reduction of direct impact on environment by production, distribution, operation and utilization of ICT, way of improvement of power efficiency (use of renewables, development of cloudy computing means, especially in remote and remote areas) and materials (reduction of use of toxic materials, processing improvement).

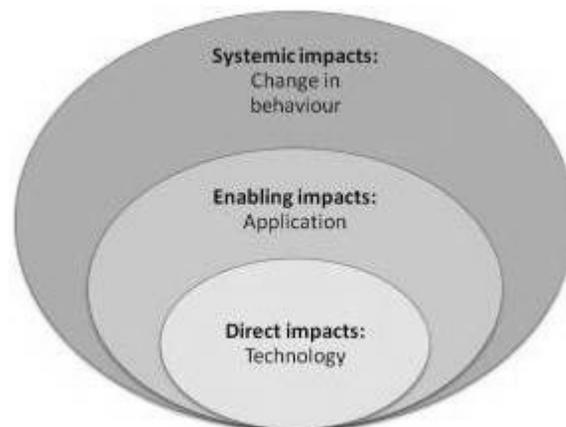
2. The stimulating influence (the second level) - impact of ICT on production efficiency, distribution and consumption of goods and services:

- increase in efficiency of consumption and production in power, transport, construction and production sectors by means of expansion of “clever systems”, reduction of emission of greenhouse gases;

- «dematerialization» of physical products and services (economy of paper at electronic billing; use of means of remote access; holding virtual meetings in the state and private sectors);

- increase in access to education (remotely), medical (telemedicine), to the state services, social interaction and cultural growth, participation in public life.

For this purpose it is necessary to provide general and inexpensive access to broadband communication networks, to promote digital literacy of consumers, to promote more active use by consumers of ICT for access to information, communication, an exchange of knowledge, expansion of new communication networks (5G), to ensure information security of consumers. The innovative approaches to management of digital economy based on democracy, responsibility, transparency and the accountability, which are turning on such mechanisms as self-regulating processes take root (Internet communities, a state policy in the field of ICT).



**Figure 1: Types of impacts of digital economy on «green» economy [3].**

3. System influences (the third level) - information support of “green economy”, transformation of behavior of consumers:

- distribution of information on decrease in negative impact on environment (monitoring of measurement of environment);

- pricing and stimulation of price sensitivity;
- assistance of technology of acceptance (technological progress provokes changes in behavior, it is possible to give «evolution» of desktop personal computers on laptops, and then netbooks as an example, digital music, e-mail, teleconferences).
- increase in access to education (remotely), medical (telemedicine), to the state services, social interaction and cultural growth, participation in public life.

Today in EU countries the foundation for the so-called “third industrial revolution” is laid. Assuming digitization of communication, power and transport and development of the so-called «Internet of goods and services». It will allow according to experts [6] ability of public organizations and individuals to control various natural and public systems in real time, to operate activity and influences of these systems.

### **FEATURES OF INFORMATION INFRASTRUCTURE OF THE REGION**

We will consider features of information infrastructure on the example of one of northern regions of the Russian Federation - the Komi Republic which is located in north-east of the European part of Russia. It should be noted that all the markets of telecommunications services in the region are liberalized, almost all restrictions of economic activity, ie, allowed privatization, partial or complete deregulation in the prices of services and control of wages and so on.

The sole provider of fixed telephony in rural settlements of the republic is OJSC «Ros-telecom». In the Komi Republic fixed telephony provided an average of 94% of rural settlements. In the sector of fixed telephony in the country as a whole, and especially in rural areas, competitors Rostelecom is not expected.

The high level of installation of telephones reached the territory and through the implementation of the program for provision of universal telephone service, when almost every village of the republic have been installed, are 757 payphones, of which 706 payphones - in rural areas of the country. Since 2012, this company was discontinued because of the high cost of this type of telephone sets (1,8 million for 1 unit.) and service (every vending machines costing the budget of the Russian Federation in the 35 thousand rubles). The head of the Ministry of Communications and Mass Media Nikolay Nikiforov commented that «it was easier to buy iPhone to each users».

Mobile services are in a period of dynamic growth. In the mobile segment of the republic a high level of competition. Investment and marketing strategy mobile operators by the state is not controlled. Mobile services have four operators - JSC «Parma Mobile» (Tele 2), OJSC «Vimpel – Communications» (Beeline), OJSC «MegaFon Ural Branch» (Megaphone), JSC «Mobile TeleSystems» (MTS).

In 17% of rural settlements of the Komi Republic of the total number of no service provider. In these villages with a population of three people to 700 people in total population of 17,700 people.

MTS is the only mobile operator to 6% of rural settlements with a total population of more than 12,000 inhabitants. For many settlements mobile Internet is the uniqueness-governmental, to gain access to the Internet, but at a low rate.

Problems of development of this sector in the Republic of Komi is, first of all, the lack of municipal cable facilities to develop their own infrastructure communications network op-

erators. Existing communication facilities are owned by Rostelecom, which restricts access to them other operators. Thus the cost of leased lines is high, which hampers the development of cellular networks in rural areas.

One of the fastest growing segments of the telecommunications market to increase the number of users and the development of infrastructure is an Internet access service. In the country there are different ways to access the Internet: broadband access using wired, fiber optic communication lines, mobile broadband wireless connections (3G technology and 4G), broadband internet access technology-based VSAT (Very Small Aperture Terminal), dial-up access.

Eleven percent of rural settlements of the republic do not have Internet access. The total population in these settlements is for about 5700 people.

Broadband Internet access is different from the dial that does not take the telephone line and in accordance with the International Telecommunication Union rules should be carried out at a speed of 256 kb/s using wired and wireless links. Fixed Shih wideband access based on wired connections in rural areas is carried out by fiber-optic communication line. Rostelecom speed traffic is not always the appropriate application.

All other organizations provide broadband or dial-up access to the Internet only in major cities of the country. Therefore, urban residents have the opportunity to choose among service providers, especially in Syktyvkar, cheaper rates. Residents of rural areas can only use the services of Rostelecom, and where it does not provide the service, use the expensive internet.

Mobile Internet services provide all four mobile operators. Tele 2 provides access to the Internet only on technology 2G. Rural settlements are regional centers of the Komi Republic covered by 3G network at least one of the three mobile operators - MTS (since 2009), Beeline and Megafon (since 2010). In 2013, MegaFon has completed construction of its own plot of fiber-optic line on the site Syktyvkar-Ukhta, a length of 420 km, before that here used microwave link.

Internet access using 4G networks is available only to subscribers of the mobile operator MTS in Syktyvkar and Pechora with similar villages from April 2014.

The problems of development of this segment in rural areas include the lack of interest of mobile operators who do not plan to develop its 3G-network all over the country, as it requires a large investment. The main reason is the large distances between settlements and the low population density in rural areas. For example, the policy is aimed only at Beeline is to spend at least 2G-network in those areas of the country where it does not exist at all.

Analog TV broadcasting is not available in 14% of villages, where 12,4 thousand people (1,3% of the total population of the republic) live. Only a few cities, urban settlement, and regional centers are currently connected to a digital TV in a test mode.

All municipalities of the Komi Republic, depending on the proportion of people living in rural areas with all kinds of information services, can be divided into groups with low (60 to 68,1%), medium (from 72,8 to 83,7%) and high (from 86,7 to 99,6%), information provision.

The analysis showed that the proportion of rural settlements with all kinds of information infrastructure (telephone, Internet, mail, broadcasting) in the total number of rural settlements small areas - from 22 to 60%, but it is in these localities majority of the population of municipalities - from 60% to 99,6% of the total population of the district.

So the development of information infrastructure of the Komi Republic has several features.

1. There is a high fixed telecommunication density in both urban and rural areas.
2. Internet is developing generally in the large settlements along a transport and economic axis of the Komi Republic – a railway from Kolas to Vorkuta.
3. The density of an alternative post network is low.
4. There is a lack of essential digital TV channels and radio channels in terms of settlements.

## CONCLUSION

As well as in a case with many «green» technologies, the governments of the republic and the country have to create appropriate favorable conditions for development of ICT. The task of the government of inclusion of ICT in «green» economy, means: universal, inexpensive access to broadband networks and services, including in remote settlements due to financing through various forms of the state investments, subsidies and standard requirements.

\* This article was prepared by comprehensive program of Ural Branch of Russian Academy of Science, project № 115041410070 «Modernization of bioresource economy of the northern region» (2015-2017).

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