

KEY MESSAGES FROM THE B20

Innovation and Development as a Global Priority

- Intellectual Property (IP) – Set a common G20 agenda for enabling successful innovation and its dissemination by improving the global IP regime. At the same time, balance strong needs for stimulating innovation and development around the world with various societal and business interests.
- Energy Efficiency and New Energy Sources – Create freer energy markets through stable, rational policies harmonized across borders. Foster energy efficiency (and decarbonization) through innovation, including government support of R&D, demonstration and pre-commercial deployment of low-carbon technologies, training, new methods of accessing technologies and producing traditional energy (with a special focus on gas), new financing schemes, and public-private partnerships. Promote universal energy access through sustained investment in the energy sector and acceleration of cost-effective renewable and energy-efficient technologies (including the production and usage of gas).
- Healthcare and Biotechnology – Focus national healthcare on increasing healthy life expectancy. Reallocate healthcare expenditure towards the development and diffusion of novel solutions that deliver better and more cost-effective outcomes. Improve efficiency through innovation. Enable technology transfer while considering the financial and legal environment for innovations as well as harmonized regulatory approaches. Promote the production and use of bio-based processes and products.
- Information & Communications Technologies (ICT) – Acknowledge the role of ICT as an enabler, facilitator of entrepreneurship, and job creator. Provide universal Internet access (access for all), including universal broadband access, and ensure minimum standards of connectivity through public-private partnerships, new business models, and adequate regulatory frameworks.

EXECUTIVE SUMMARY

INNOVATION AND DEVELOPMENT AS A GLOBAL PRIORITY

The world economic downturn is of great concern to both governments and the international business community. With state budgets under pressure and the private sector reluctant to invest in long-term projects, now more than ever innovation policies must be effective, relevant, coherent, inclusive,¹ and internationally consistent.

To address this problem, the B20 has identified several areas in which innovation and development must become absolute priorities:

- Intellectual property (IP)
- Energy access, efficiency, and renewable and low-carbon energy sources
- Healthcare, industrial biotechnology and sustainable food production
- Information & Communications Technologies (ICT)

Within these areas, the B20 proposes policy approaches that, if adopted by G20 leaders, will stimulate economic growth, development, and create jobs through the promotion of innovation. Specifically, the B20 seeks ways to facilitate the dissemination of knowledge and technological innovation through cross-border investment and technological collaboration among developed and developing countries. The G20 should focus on *incremental improvements* to the global system, thereby *transitioning* to an improved global environment in a balanced way. These improvements will, *inter alia*:

- Improve technology transfer to further innovation and development.
- Make markets freer and less pliant to counterproductive distortions through harmonization and stabilization of regulation and reduction of barriers for economic cooperation, including non-tariff barriers.
- Improve the dissemination of technology, knowledge and resources for innovation and development.
- Increase efficiency in the delivery of ICT, healthcare, and energy through the deployment of innovations, new business models, and private-public partnerships and though robust and reliable intellectual property regimes.
- Allow universal access to energy, ICT, biotechnology and healthcare.

¹ See OECD, Science, Technology and Industry Outlook 2012, OECD Publishing.

INNOVATION AND DEVELOPMENT AS A GLOBAL PRIORITY

TASK FORCE RECOMMENDATIONS

The recommendations presented in this report reflect the contributions of the 39 participants of the Innovation and Development as a Global Priority Task Force, functioning during Russia's presidency of the G20 in 2013. The Task Force consists primarily of CEOs from G20 countries who represent the world's leading innovative firms. The goal of the Task Force is to offer the world a way to *transition* to an improved global innovation and development environment drawing on views and insights from a large and diverse set of states and businesses.

The B20 envisions:

- A world of creators – where policy approaches to innovation, including on IP, stimulate a dramatic increase in the creativity of citizens.
- A world with universal energy access, secure supply, reasonable prices (as well as mitigated price volatility), and minimal environmental damage – where investments are made in renewables that can be effectively and economically sustained and traditional energy sources are further developed and environmentally improved with cutting-edge cost-effective and productive innovation.
- A world of unprecedented healthy longevity – where policy makers focus on better living conditions and better quality of life.
- A world of sustainable resource consumption with an increasing use of biotechnological products and processes.
- A world of more rational, better-informed decision-makers – where ICT is universally accessible and applied to all sectors of the global economy.

1. INTELLECTUAL PROPERTY (IP)

1.1. Global IP Regime for Innovation and Development

Starting Point

The global IP regime is crucial for both innovation and development. In the words of Joseph Stiglitz, Nobel laureate economist, “[i]ntellectual property is one of the most important aspects of globalization, especially as the world moves toward a knowledge economy. How we regulate and manage the production of knowledge and the right of access to knowledge is at the center of how well this new economy . . . works and of who benefits. At stake are matters of both distribution and efficiency.”²

Despite innovative industries' dependency on the global IP regime, which regulates ownership and distribution of knowledge and technologies throughout the world, the G20 agenda has not yet acknowledged the importance of a global IP regime for economic development.

Recommendations

² J.E. Stiglitz, Economic Foundations of Intellectual Property Rights, Duke Law Journal, 57 (2008), p. 1695.

G20 efforts to propel economic development and stimulate growth must recognize and reflect that:

- A reliable global IP regime plays a critical role in encouraging innovation and innovation-driven economic development and growth, and it must be thoughtfully fine-tuned.
- Reducing barriers to obtain and enforce IP rights can stimulate technological innovation and, thereby, economic development.
- Broadening access to knowledge, advanced technologies, and best practices³ through, *inter alia*, supporting and providing incentives for cross-border partnerships and investment, together with sufficient and consistent enforcement of IP rights, can help expand the base of innovation and social development worldwide.

1.2. Global Legal Framework for Fair Competition in Innovation Markets

Starting Point

The world economy has been liberalized significantly as a result of intergovernmental cooperation on reducing import restrictions and export subsidies (*e.g.*, through GATT, WTO, and bilateral investment treaties). At the national level, similar liberalization efforts have typically resulted in the creation of antitrust regulation and authorities designed to fight cartels and other private combinations limiting competition on the market.

Despite the great need, especially of innovative markets (fair trade in IP goods), such protection mechanisms are not yet in place at the international level.

Recommendation

G20 leaders should formulate and propose a regulatory mechanism functioning on a global scale – through WTO mechanisms, an international treaty, the G20, or otherwise – to improve global competition. This is especially significant for innovation markets and global value chains (*e.g.*, in the ICT, agriculture, energy, and pharmaceutical sectors).

2. ENERGY EFFICIENCY AND NEW ENERGY SOURCES

2.1. Increasing Energy Efficiency

Starting Point

Improving energy efficiency is a necessary overarching step aimed at cutting costs, reducing emissions, and using world resources in a sustainable and thoughtful manner. It is a critical aspect of any policy aiming to reduce CO2 emissions associated with energy and to allow better energy access for low-income consumers. More efficient energy production, the elimination of losses in distribution networks, the priority of energy efficiency in the housing sector, well-targeted information, and education efforts encouraging responsible behavior are all important. Innovation is a critical component of greater energy efficiency.

Recommendations

The G20 should:

³ *E.g.*, *inter alia*, digitization of printed materials, e-delivery, and open access to publicly funded research.

- Guarantee governments' lasting political commitment to energy efficiency and affirm their understanding of its impact on security and the economy through measures including the following:
 - Holding B20/G20 dialogues on energy efficiency on a regular basis
 - Ensuring policy focus on regions and business sectors with the highest potential for achievement⁴
 - Supporting energy efficiency policies and fostering the sharing of best practices and successful initiatives on an international scale
- Establish clear standards for energy efficiency and ensure full monitoring and compliance, including the following measures:
 - Establishing a mechanism for regular progress reports from G20 countries in order to monitor the implementation of standards in all areas of energy efficiency
 - Training, educating, and contributing to the development of adequate resources for the implementation of energy efficiency
- Increase public investment in and promote the deployment of efficient and innovative technologies such as demand-response, end-use energy efficiency, energy storage technologies and renewable energy technologies, particularly to improve urban sustainability (*e.g.*, higher air quality, more efficient energy use and economic development):
 - Provide public financial support to companies, individuals or cities, for example, via performance contracting or low-interest loans, to support innovative local projects.
 - Support pilot projects and research initiatives in all areas of the smart grid, energy storage considering both innovative technologies and new business models.
 - Explore innovative financing schemes to attract investments in new technologies with long-term horizons, such as smart grids.
- Adopt a holistic approach to energy management, assessing the process end to end (from exploration and production, to consumption, to emissions).

2.2. Improving Energy Access

Starting Point

According to the International Energy Agency, today approximately 1.3 billion people (around 20% of the global population) have no access to electricity and 2.6 billion people (above 35%) live without clean cooking facilities.⁵ Energy poverty is concentrated in the developing world, particularly in Asia and Sub-Saharan Africa. However, energy poverty is evident in the industrial world as well, underscoring the importance of securing affordable energy prices everywhere. In accordance with the Millennium Development Goals,⁶ the international community recognizes that this is a serious obstacle to economic and social development. Applying the Task Force's

⁴ *E.g., inter alia*, energy efficiency standards for commercial buildings (see 2013 World Energy Outlook prepared by the International Energy Agency).

⁵ Here, energy access is defined according to the International Energy Agency as a "household having reliable and affordable access to clean cooking facilities and a first electricity supply connection, with a minimum level of consumption (250 kilowatt-hours [kWh] per year for a rural household and 500 kWh for an urban household) that increases over time to reach the regional average."

⁶ See United Nations, Millennium Development Goals Report 2011, June 2011, available at: <http://www.refworld.org/docid/4e42118b2.html> [accessed 31 May 2013].

emphasis on incremental improvements to the global system, B20 energy companies ultimately aim at “energy access for all.”

Recommendations

The G20 should:

- Focus on prioritizing energy access in national development planning, improving the investment climate, and promoting energy access solutions.
- Harmonize technical standards, the regulatory environment, and fiscal (tax) policies for energy equipment and services importation, marketing installation, and distribution.
- Promote global standards to avoid duplicating efforts and market effectiveness.
- Emphasize the importance of energy for education and health.
- Support the development of associated technology as an additional measure promoting universal access to energy.
- Support national governments in creating conditions for expanded and decentralized energy infrastructure to serve remote populations by providing investment incentives (limited subsidies, guarantees, reduction of custom duties for renewable and other relevant energy technologies) and support for pilot projects.⁷
- Provide capacity-building support, including small-scale financing for small and medium-sized businesses (SMEs) in developing countries to deliver modern energy services, including services to rural communities.
- Develop a framework for more efficient development of and public-private cooperation for energy production (including viable decentralized solutions), import and distribution infrastructure, and business models (with a focus on developing countries), and ensure regular reporting to the G20.
- Disseminate existing best practices and implementation methods among developing countries and energy providers, with special attention to training.
- Invest in networks and systems capable of successfully managing decentralization and overall economic efficiency and sustainability.

2.3. Enhancing Energy Security and Reliability

Starting Point

Universal access to clean energy is expected to be achievable by 2030.⁸ This would require a total investment of USD 1 trillion from 2011 to 2030 (3% of the global energy-related infrastructure investment). Technological solutions that could enable such universal access would increase global energy demand and CO2 emissions by no more than 1.1% and 0.7%,⁹ respectively. These results are contingent on a sustained improvement of energy efficiency, a

⁷ Lack of conventional high carbon infrastructure (*e.g.*, large centralized power plants and power line distribution) in poor countries can be regarded as an opportunity to develop distributed energy infrastructure and build new green infrastructure rather than as a constraint. Using renewables in remote areas with low density of population can be preferable in certain circumstances; however, in poor countries with many people living in rural areas local access to energy through decentralized power systems and portable energy supply becomes crucial due to prohibitive costs of conventional infrastructure development.

⁸ International Energy Agency, *Energy for All: Financing Access for the Poor*, November 2011, Paris, France: OECD/IEA, p. 20, available at: http://www.iea.org/papers/2011/weo2011_energy_for_all.pdf [accessed 31 May 2013].

⁹ *Ibid.*, p. 27.

high investment effort in the energy sector and the unlocking of renewables potential and technological advances.¹⁰

The scale of investment needed to meet these objectives efficiently requires freer markets – where technologies freely compete and prices are non-distorted. Clear and robust price signals that internalize the cost of carbon emissions can provide the certainty that will allow long-term investments that are efficient and sustainable. This in turn will allow technologies to compete on a level playing field. Supporting policies such as inefficient subsidies¹¹ should be avoided to provide for a non-distorted market environment.¹² The remuneration regime for networks should be coherent with these developments in order to ensure an appropriate return on investments. (However, in certain limited circumstances subsidies should be made available – though limited in time and amount – to stimulate private investment, *e.g.*, in pilot renewable energy projects that are not yet competitive. This is especially crucial for marine energies – *e.g.*, offshore wind, tidal – in moving from prototype to commercially viable product, considering their tremendous potential on the planet.

Achieving freer energy markets will require a harmonized and stable regulatory framework both at global and local levels.

Recommendations

G20 leaders should:

- Limit (and eventually abandon) the use of inefficient subsidies both in fossil fuels and renewables. Policies that create inefficiencies and distort the market, such as command-and-control mandates and unsustainable subsidies, should be avoided.
 - Work with G20 leaders to better assess the effectiveness of existing energy subsidies and work toward phasing them out in favor of putting a cost or value on the externality in question, such as carbon or innovation.
 - Promote a stable regulatory framework that enables long-term price signals set by the market to drive investment and innovation, such as market-based carbon trading and capacity remuneration.
- Promote free trade in goods and services by sustaining trade liberalization negotiations, including on sustainable energy products and services.
- Eliminate tariffs, local content requirements, and other non-tariff barriers, and coordinate industrial and technical standards. Reduce tariff and non-tariff barriers that distort international trade, including anti-competitive standards and technical requirements. Develop a truly global initiative to lower barriers to green trade by establishing a multilateral agreement at the 9th WTO Ministerial Conference in Bali (2013).

¹⁰ Renewables are undergoing a period of rapid development, bringing substantial improvements in cost, performance, and reliability. Though some renewables, such as onshore wind or hydroelectricity (the lowest LCOE), already compete with conventional energy in some regions, and others, like solar Photovoltaics (PV), have seen costs fall significantly, they are still not competitive on the whole (*e.g.*, hydro with the lowest LCOE).

¹¹ *E.g.*, tax credits, investment grants, low-interest loans, price premiums, preferential buy-back rates (or feed-in tariffs, FITs), green certificates, quotas, Renewable Portfolio Standards (RPS), net metering et al.

¹² Subsidies may distort markets in three ways: 1) by creating unfair competitive conditions, 2) by reallocating the value of the subsidies to unintended parties — often more value is captured by the them, 3) by shifting the allocation of capital and other resources to technologies and business models that can never be economically sustained. Additionally, governmental subsidies are often unsustainable, putting pressure on governmental fiscal policy and balance sheets, as public demand for the subsidized good or service increases beyond the government's ability to pay.

- Support the opening of energy markets and reform of regulatory and tax policies, including appropriate regulation of unconventional gas development, to allow the flow of innovations across borders.
 - Work with existing intergovernmental organizations such as the International Energy Agency and the World Bank to monitor and assess enhanced transparency in energy markets, find optimal cost/benefit solutions for society's energy needs, facilitate sharing of best practices among their member countries regarding energy market design, energy regulation, and energy-related fiscal policies, and report back to G20 Energy Ministers on a periodic basis.
 - Provide R&D and technology demonstration funding to support the development of technologies from prototypes to commercially viable products (*e.g.*, marine energy, energy storage).

2.4. Enhancing and Ensuring Energy Sustainability

Starting Point

Sustainable innovation is a fundamental driver of competitiveness, job creation, and long-term economic growth.

Intensification of global green and low-carbon trade can increase competition, reduce prices, and also encourage innovation and diffusion. Though they share a common interest in green growth, developed and developing countries choose their own goals and means of policy implementation. The sustainability of investments is another key aspect to be considered here.

Recommendations

G20 leaders should:

- For developed countries – implement and strengthen carbon-pricing mechanisms, such as the European Union Emissions Trading System (ETS), ensuring that their national targets and policies support the creation of consistent international demand for carbon units and provide the basis for an international carbon market.¹³ For developing countries – define a gradual transition to participation in similar mechanisms.
 - Build confidence in new market mechanisms through international platforms.
 - Make new market mechanisms eligible for current and upcoming emissions trading systems.
 - Establish a fund to support innovation and demand certainty for early new market mechanisms.
 - Encourage emission mitigation and clean energy investments in developing countries through international linkages, such as the recognition of new market mechanisms.
 - Sustain demand by setting more ambitious mitigation targets for G20 nations over time.
 - Promote cleaner energy in certain areas of the world where natural resources are abundant in order to reduce or avoid emissions (this should be undertaken rationally) and maintain an attractive remuneration regime for networks.

¹³ Bearing in mind the current European situation, such a market would need to rely on a mechanism that sends the appropriate signals so that pricing remains dissuasive enough to encourage greener and lower emitting alternatives.

- Establish a working group¹⁴ bringing together institutional investors (especially pension and insurance funds), international organizations (including multilateral development banks and the OECD), and national representatives to begin a dialogue on actions needed to scale up financing for green and low carbon intensive technologies.
- Adopt a systematic approach for technology development to arrive at commercial solutions.
 - Launch a set of international flagship projects focused on relevant energy challenges in G20 countries.
 - Support negotiations on the liberalized trade of green products and services.

2.5. Ensuring Energy Balance by Focusing on Natural and Shale Gas

Starting Point

Natural gas is the only fossil fuel for which global demand seems to be growing in all scenarios. It is estimated to grow up to 65% by 2040. Meeting such demand would require the world's annual natural gas production to increase by 1.8 trillion cubic meters, with unconventional gas accounting for nearly half of that increase by 2035. The greater use of conventional (natural) gas and unconventional (shale) gas can lead to more rapid decarbonization than would be possible through the use of renewables alone. Currently, it is the least-carbon emissive fossil fuel (a thermal unit emits half as much as a coal plant) and the best compromise in terms of flexibility, competitiveness, security of supply, and environmental concerns. Natural gas is a complement and not a substitute to renewable energies, and it should be supported as an optimal response to renewables' intermittency.

Recommendations

The G20 should:

- Focus policy on supporting the substitution of coal with technologies that have lower emissions, such as natural gas and unconventional gas, in the energy mix of G20 countries. Encourage and support developing countries in utilizing natural gas, natural gas liquids and unconventional gas in their energy mix.
- Use certain revenues resulting from carbon pricing measures to increase direct support for research, development, demonstration, and pre-commercial deployment of low-carbon and energy efficient technologies, including conventional and unconventional gas.
- Focus on developing equal and uninhibited access to cutting-edge technologies in the conventional and unconventional (shale) gas sectors globally.
- Consider natural gas the optimal fuel to bridge the supply-demand gap in transportation and encourage the development of natural gas technologies for transportation.
- Set a common agenda to build stable legal, tax, and regulatory frameworks for the gas industry that would foster development and promote fair competition.

3. HEALTHCARE AND BIOTECHNOLOGY

¹⁴ Such a working group might cooperate with the Green Growth Action Alliance, which was launched at the Los Cabos B20 Summit in 2012.

3.1. Focusing National Healthcare Priorities on Healthy Life Expectancy and Productivity

Starting Point

Since the early 1900s, improvements in healthcare and public health have extended life expectancy in developed countries by three to four years each decade. This has improved the productivity and longevity of labor capital, fueling both general economic growth and the success of innovative healthcare industries.

Although innovation in healthcare and public health still has the potential to advance life expectancy, paradoxically, as a result of increasing wealth, longevity, and changes in lifestyle, developed countries now face new healthcare challenges such as obesity, diabetes, Alzheimer's, and cancer. These diseases threaten economic sustainability, as associated healthcare costs rise faster than GDP.

The application of biotechnology to primary production, health, and industry could result in the emergence of a "bio-economy" where biotechnology contributes to a significant share of economic output.

Recommendations

The G20 leaders should:

- Establish and champion an agenda that aligns incentives in industrial, economic, and healthcare policy to accelerate the shift in spending on healthcare innovations and delivery away from treating illness and extending absolute life expectancy to a new focus on extending healthy and economically productive life expectancy. By leveraging the relationship between healthcare and economic prosperity, this initiative will support the economic stability and security sought by G20 policy-makers. It will also address legitimate concerns over the impact of diseases such as diabetes and Alzheimer's on healthcare budgets.
- Shift the perception of healthcare expenses from social costs to economic investment.
- Establish and publish metrics on healthy life expectancy as driving forces of economic development.
- Improve measurement of healthcare spending.
- Set country-specific priority areas with targets for improvement.
- Launch co-funded private/public research for cross-G20 priority areas.

3.2. Reallocation of Current Healthcare Expenditures towards the Development and Diffusion of Novel Solutions that Deliver Better Outcomes

Starting Point

Given the current status of public finance, the private sector of the G20 economies recognizes that it will be contributing a growing share of investment in healthcare innovation.

Compounding financial pressure and market dynamics in centralized payer environments prevent adequate funding and growth of innovative healthcare industries. These challenges are also relevant for developing countries with large populations whose basic healthcare needs remain

unmet. The principle of stimulating investment in innovations that drive healthy life expectancy and productivity holds true for all G20 members.

As governments globally consider how to manage budgets in the challenging economic environment, the efficiency of healthcare spending and investment should be maximized. This will ensure the continued realization of economic benefits of productive and healthy populations, as well as sustainable economic growth within new and existing healthcare industries.

The B20 seeks for G20 members and key health and science policy-makers in G20 countries to align economic, industrial, and healthcare policies that will allow innovations to proceed undeterred even under current market and budget constraints and take full advantage of the global nature of 21st-century innovation.

Recommendations

The G20 leaders should:

- Create specific incentives to drive private investment in novel healthcare industries and priority healthcare outcomes.
- Maintain current levels of public investment in healthcare.
- Maintain innovations as a tool for more efficient healthcare funding.
- Improve healthcare efficiency by enabling technology transfer.

3.3. Dissemination of Best Practices and Rapid Adoption across G20 Countries

Starting Point

Today healthcare biotech accounts for more than 20% of all marketed medicines. It is already benefiting more than 350 million patients around the globe who rely on biotech medicine to treat and prevent everyday and chronic illnesses, including heart attacks, stroke, multiple sclerosis, breast cancer, cystic fibrosis, leukemia, and diabetes. It is estimated that by 2015, 50% of all medicines will come from biotech. Currently, there are more than 200 biologic medicines and vaccines that benefit millions of patients worldwide, in developed as well as in developing countries. There are more than 1,200 biotech diagnostic tests being used in clinics around the world. More than 600 new biologic medicines are in development, including treatments for cancer, HIV/AIDS, Alzheimer's disease, and numerous rare conditions. Healthcare biotech increases the effectiveness and safety of treatments. All these practices are highly transferrable.

Recommendations

The G20 leaders should:

- Create a catalogue of innovations and best practices with proven, measurable impact.
- Exchange evidence of successful implementation of the best practices between G20 and B20 including at the summit level.
- Provide a transparent and predictable regulatory approval process for new drugs that is science-based and internationally recognized.
- Improve the funding capabilities of innovative projects, research facilities and industrial research ventures by providing tax incentives, investing in Life Sciences, offering policies

that encourage foreign investments, and maintaining a stable financial market and health care system.

3.4. Promoting Production and Use of Bio-based Processes and Products

Starting Point

The application of biotechnology to primary production, health, and industry has the potential to create an emerging bio-economy in which biotechnology contributes a significant share of future economic output. The OECD estimates that the bio-economy could account for 2.7% of the world's GDP by 2030, with the largest economic contribution of biotechnology in industry and primary production, followed by health applications.

At the same time, the commercialization of R&D in bio-based products often proves challenging, meaning that many products fail to make it to the market. This can have several causes, including high development costs and regulatory barriers for bringing new bio-based products to market.

Deployment of commercial-scale integrated bio-refineries is a critical step towards realizing the potential offered by industrial biotech. Bio-refineries convert biomass into industrial intermediates and final products. It is crucial to establish proof of concept and to test the emerging technologies used in the integrated bio-refineries under industrial conditions. Full-scale manufacturing facilities or even pilot plants are often not accessible to public and private sector researchers, meaning that concepts and new technologies developed in the lab often cannot be tested on a larger scale. It is therefore necessary to ensure access to scaled-up bio-refining infrastructure to test industrial processes with the purpose of reducing both lead-time and investment.

Recommendations

The G20 should:

- Secure an affordable supply of sustainable biomass feedstock for bio-based industries, *e.g.*, through supportive programs and agricultural policies.
- Support the construction of the first full-scale integrated bio-refineries, accelerating the deployment of a new infrastructure for the bio-based economy. This can come in the form of funding schemes, loan guarantees or the implementation of conducive framework conditions.
- Incentivize the conversion of conventional industrial processes into bio-based ones, *e.g.*, through approval systems or by providing market incentives to overcome initial investment barriers.
- Provide market incentives to stimulate the commercialization of bio-based products, *e.g.*, via public procurement standards, regulation and labeling.

3.5. Implement Coherent Bio Economy Strategies and Framework

Starting Point

Biotechnology offers solutions to address the most pressing issues of societies today and in the foreseeable future. Using new methods and innovative procedures, biotech helps to tackle problems such as fighting disease, feeding the hungry and improving the environment, whilst

providing for steady economic growth. Estimates for 2030 based on the current framework suggest that biotechnology could account for 2.7% of the GDP of OECD countries. The bio economy encompasses many economic sectors and a wide range of policy areas at global, regional and national level, resulting in a complex and sometimes fragmented policy environment. Accordingly, there is a need for a more informed dialogue and better interaction between existing bio economy-supporting policies at regional and national level, as well as a regulatory harmonization process. Doing so will encourage private investment.

Recommendation

G20 leaders should develop and implement coherent bio economy strategies and action plans,¹⁵ and strengthen cooperation on promoting the bio economy at the regional and global level.

3.6. Stimulate and Support Innovation and R&D in Biotechnology

Starting Point

Industrial biotechnology is a relatively new science with major areas of knowledge still to be explored and understood. This offers tremendous opportunities for further R&D and breakthrough innovation. Developing biotech products is scientifically demanding, capital intensive, time-consuming, and commercially risky. It is therefore of the utmost importance to foster an innovation-friendly environment in which biotech innovation can prosper and within which scientists, businesses, investors, and regulators can properly work together to discover, develop, and market innovative biotech products. Education is fundamental not only on the supply, but also on the demand side. Proper education, especially in the field of applied sciences, provides for a scientifically skilled workforce able to staff R&D facilities and offers the consumer a better understanding of biotech as a way of improving one's life.

Recommendations

G20 leaders should:

- Ensure that governments and companies make adequate investments in basic education and applied sciences by funding educational facilities, university research laboratories, research institutes, and private companies. Support collaboration between public and private sector actors, *e.g.*, by creating public-private partnerships.
- Recognize the importance of IP rights for attracting private investments necessary to support biotech innovation. IP incentivizes R&D in that field of innovation providing planning security to a certain degree, putting the initial financial cost into perspective with possible returns. IP rights also form the basis of efficient knowledge flows within scientific networks, diminishing the concerns of intellectual property theft.

3.7. Promote the Production and Use of Bio-based Processes and Products

Starting Point

Commercialization of basic and applied R&D in bio-based products often proves challenging. Many products fail to make the transition from research to the market. This problem has been called the “valley of death” because of challenges related to the high costs and regulatory

¹⁵ In 2012, both the EU and US developed bio economy strategies.

barriers of bringing a new bio-based product to market. Agricultural biotechnology holds great hope for meeting this challenge by increasing crop yields, preserving and improving soils, enhancing the control of pests, weeds and harmful diseases, and producing more healthy food with enhanced vitamin and nutrient levels.

Diseases and pests currently reduce global food production by more than 35%, at a cost of more than USD 200 billion a year. Corn and cottonseeds enhanced with *Bacillus thuringiensis* (Bt), a bacteria used widely in conventional and organic agriculture, have a built-in defense against the most threatening insects, reducing the need for pesticides. These new corn and cotton varieties save farmers' time and money, while also lessening the impact of agriculture on the environment. Through biotechnology common crops like cotton, corn, soybeans and canola can be grown using conservation tillage, resulting in less plowing and healthier soils.

Recommendations

G20 leaders should:

- Secure that an affordable supply of bio-based, sustainable raw material (biomass feedstock) is available for bio-based industries, *e.g.*, through supportive innovation programs and agricultural policies.
- Maintain transparent, non-discriminatory, competitive, and commercially viable markets for biotech products.
- Include biotech innovations within development aid schemes to harness the possibilities that they offer low-income countries to combat local challenges such as disease and malnutrition, and thus foster innovation, while providing developing countries with more efficient technologies to improve living standards in those areas.

4. INFORMATION & COMMUNICATIONS TECHNOLOGIES (ICT)

4.1. Enhancing ICT Infrastructure Development for Internet

Starting Point

The promotion of an open and interconnected Internet fosters industries and new business models. ICT creates new economic opportunities for businesses and entrepreneurs, providing access to previously underserved population segments. The growth and stability of the international Internet infrastructure is best served when Internet interconnection agreements are left to competition forces, with the objective of increasing the percentage of the population with Internet access from 35% to 70% in G20 countries.

Recommendations

The G20 leaders are encouraged to:

- Commit to promoting an open and interconnected Internet through support of open markets and pro-investment policies, independent regulators, pro-competitive legal policy, fair regulatory frameworks, respect for the rule of law, an adequate level playing field amongst different actors in the market and IP rights protection and enforcement. Streamlining national and international IP protection policies will help ensure that there is a level of playing field for both start-ups and established corporations.

- Define minimum guaranteed standards of ICT services and facilities for G20 countries and encourage other countries to conform to these standards.
- Leverage ICT to create new economic opportunities for businesses and entrepreneurs to provide access (traditional services) to previously underserved population segments through ICT content, applications and other innovative ways and business models.
- Eliminate barriers to trade in ICT products and services by expanding product coverage under the WTO's Information Technology Agreement (ITA).
- Harmonize ICT regulation on a global scale, with a particular focus on rethinking the global approach to privacy issues and cross-border transfer of data and ICT services.¹⁶

4.2. Enable Broadband Access for All

Starting Point

Reliable broadband Internet access is essential for households to benefit from online services, for businesses to compete nationally and globally, and for citizens to be part of the digital environment. The ability of broadband providers to maintain and invest in robust, expanding broadband infrastructure requires a coordinated, unified policy approach from government agencies that support private sector investment and innovation.

ICTs help people innovate, provide access to education, create jobs and important facilities, and drive growth in different sectors of the economy, including agriculture, medicine, and energy (smart grid).

Recommendation

The G20 should define national legal, policy, and regulatory frameworks that incentivize and create a stable environment for investment (including public-private partnership mechanisms) and fostering a sustainable competition in a long-term perspective, pursuing special policy for geographically remote areas. It should also invite relevant international institutions to create a robust database for tracking and comparing delivery of universal broadband access across countries.

4.3. Increasing Agricultural Productivity through ICT

Starting Point

Farm extension services are a proven mechanism for providing critical access to information and expert advice to small and medium-sized farmers. There are a growing number of examples in the developing world of applied low-cost ICT solutions linking farmers to mediated information networks. In addition to providing access to expert advice, it is imperative to begin the process of information sharing among farmers at regional, national and international levels. This in turn builds trust, fosters cooperation, and increases productivity. Access to ICT services allows direct contact with consumers, more cost-effective brand building, and improved competitiveness through price and market monitoring. Access to ICTs is indispensable for strengthening land administration and rural governance.

¹⁶ The Open Government Initiative might be a good model of harmonization on a global scale.

Recommendation

The G20 should support the promotion of an open and interconnected Internet to ensure access to ICT services for small and medium-sized farmers and agricultural networks in developing countries to promote direct contact with consumers, more cost-effective brand building, and improved competitiveness through price and market monitoring, as well as dissemination of new technologies.

4.4. Data Protection and Privacy

Starting Point

Private and public sectors are still determining the boundaries of data privacy. Governments play a key role in protecting the interests of the state and its citizens by fighting cyber-crime (including acts of terrorism) and strengthening data protection mechanisms. To achieve these objectives, governments need access to information. Multinational corporations set up global data centers that are governed by country-specific information security and data privacy laws. Such complex networks not only call for inter-governmental cooperation but also for cooperation between governments.

Recommendations

The G20 should:

- Articulate the dangers of a lack of inter-governmental cooperation in the area of data protection and privacy.
- Define the loopholes that need to be closed in order to strengthen the governance and policy frameworks.
- Provide and foster a platform where national governments and private sector organizations will be able to discuss, debate and drive action.