

# Major Economies Business Forum

## on Energy Security and Climate Change



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## Major Economies Business Forum: The Emerging Innovation Consensus

### Key Messages

- Technology continues to play an essential role in addressing climate change. While a vast array of more advanced solutions are available today, innovation will be essential to develop better, lower-cost technologies to tackle both adaptation and mitigation more affordably.
- Innovation lies at the heart of our ability to confront the challenges posed by climate change. Whether matching local needs and the environment with the appropriate solutions, identifying suitable business and financial models that allow them to take hold, or developing novel technology approaches, we need fresh thinking to bring about meaningful transformation. But innovation will remain stagnant without a framework that encourages and nurtures it.
- A substantial body of literature has emerged that assesses the types of policies that have worked or failed to foster innovation and to encourage technology dissemination and deployment. A consensus is emerging that nations across the spectrum of development - ranging from developed, middle-income, to least developed - can pursue several types of pro-innovation, pro-technology policies to attract innovators from abroad, encourage home-grown innovation and collaborative technology partnerships, and to move up the innovation value chain.

- These innovation-enabling factors include taxation and fiscal policy, regulatory stability, rule of law and an honest, independent judiciary, infrastructure investment, foreign direct investment (FDI), education and workforce policy, and intellectual property rights (IPR), among others.

## Introduction

An international consensus among policymakers, business leaders, and academics, in both the developed and developing world, has emerged around the types of policies that nations can put into place to foster innovation and encourage the development of advanced-technology industries that can craft and help implement solutions to address climate change. It starts by establishing an environment that promotes partnership between all parts of society.

With respect to participation by the private sector, carefully designed and balanced government policy can shape the risks and rewards necessary to spur engagement.

Activating the private sector is imperative to promote the development and commercial use of clean technology and the implementation of climate mitigation strategies. Private sector actors are on the leading edge of advanced and cleaner technology development, but investments in such technologies can take many years to come to fruition, requiring a suitable and stable investment climate. Stimulating private sector activity can come about through many different policies, including market mechanisms, regulations and mandates, subsidies, or voluntary approaches. They require careful design and ongoing assessment to assure that policies are working efficiently alone and in combination.

There are also opportunities to adapt existing technology solutions to local

needs, but such efforts cannot occur in a vacuum. For example, conducting Technology Needs Assessments (TNA) should lead directly to achievable and bankable projects where actors from all parts of society, including the private sector, can readily engage. It is important to note, however, that it may be difficult to attract the appropriate implementers for individual projects (especially small-scale projects). To combat this, the Climate Technology Centre and Network (CTCN) or other suitable organizations could play a role by helping to aggregate country needs into regional projects that could more easily be executed. Reducing the cost to get technologies across borders through the liberalization of environmental trade could also accelerate deployment of the related goods and services. The draft Environmental Goods Agreement, currently under negotiation outside the UNFCCC process, is a positive initiative in this regard.

## The Emerging Innovation Consensus

More generally, studies and experience have demonstrated that the following types of pro-innovation, pro-technology policies are of critical importance to foster a culture of innovation, develop a strong local technology base, and encourage both the development of new technologies and enable their broader deployment, implementation, and use:

- **Tax Policies:** A common theme among countries that enjoy success in attracting investment and innovation

is a pro-innovation tax environment. A competitive overall tax rate and targeted tax policies aimed at encouraging innovation can attract local manufacturing which, in turn, accelerates technology transfer and dissemination. A recent survey by PricewaterhouseCoopers (PwC) of countries that have been successful in attracting high-technology organizations, including China, Finland, Germany, India, Malaysia, Singapore, and various U.S. states, found that these countries pursued a largely similar set of tax policies, including competitive tax rates, tax incentives for R&D and investment, capital depreciation, a tax regime that enables the exchange of know-how through IPR, tax holidays, and geographic tax free zones.<sup>1</sup> The survey concluded that, of all the developed and developing nations part of the survey, “emerging countries tend to use more types of tax incentives, but not necessarily different ones.”<sup>2</sup> Indeed, tax policies can provide among the most efficient incentives to foster innovation: tax incentives for R&D, for example, incentivize the long-term effort required to allocate capital to develop advanced technology.<sup>3</sup> Nations can

thus tailor their particular tax policies from a menu of pro-innovation tax options depending on their specific goals, such as encouraging large-scale production investments or indigenous start-ups.

- **Overall Regulatory Stability:** Beyond a pro-innovation tax policy, innovators require general regulatory stability and confidence in the rule-of-law. If a nation frequently alters its fiscal or regulatory regime, such as tax rates, trade policy, or intellectual property protections, innovators will be less likely to come to the country and, if they have already arrived, less likely to stay. For example, an OECD study on regulatory policy has underscored that “a poor regulatory environment undermines business competitiveness and citizens’ trust in government, and it encourages corruption in public governance.”<sup>4</sup> Introducing new technologies to a country ties up resources over a long period, as technical capacity and physical infrastructure get built over time. Overall regulatory stability ensures that the market is well-functioning in the country and that individuals are encouraged and rewarded by taking risks that are necessary to innovate.

<sup>1</sup> PricewaterhouseCoopers. 2010. *Innovation: Government’s Many Roles in Fostering Innovation*. Available at: <http://www.pwc.com/gx/en/technology/pdf/how-governments-foster-innovation-2010.pdf>.

<sup>2</sup> *Ibid.*

<sup>3</sup> Palazzi, P. 2011. *Taxation and Innovation*. OECD Taxation Working Papers, No. 9. Available at: [http://www.oecd-ilibrary.org/taxation/taxation-and-innovation\\_5kg3h0sf1336-en](http://www.oecd-ilibrary.org/taxation/taxation-and-innovation_5kg3h0sf1336-en). See also: Gale, W, and Brown, S. 2013. *Small Business, Innovation, and Tax Policy: A Review*. Brookings Institution. Available at: <http://www.brookings.edu/~media/research/files/papers/2013/04/small-business-tax-policy-gale/small-business-tax-policy-gale.pdf>.

- **Infrastructure Investments:** Governments also need to invest in infrastructure for innovation and technological development to thrive. Such infrastructure comes in many forms, including roads, ports, pipelines, and transport, reliable access to electricity, or high-speed internet access. Having these building

<sup>4</sup> OECD, 2010. *Regulatory Policy and the Road to Sustainable Growth*. Available at: <http://www.oecd.org/regreform/policyconference/46270065.pdf>.

blocks in place increases the chances for technologies to take hold, reducing risk and making it easier to invest. For example, the Indian state of Gujarat has developed an extensive policy framework for encouraging public-private partnerships for infrastructure in the energy and transportation sectors, including model concession agreements and making available public financing to complement and attract private investment.<sup>5</sup> This framework, for example, has resulted in the first ever private port project in India, as well as the development of private energy terminals.

- **Attracting FDI and Financing:** Attracting FDI and financing also serves as a fundamental enabling factor for innovation and high-technology development. Through the import of technology and knowledge, the prospects for locally relevant innovation increases.<sup>6</sup> For example, beyond serving as a springboard for technology transfer, FDI can assist in integrating a country into global supply chains. More broadly, innovative nations have a robust investment and financing infrastructure in place for innovators and entrepreneurs to be able to set up and expand their businesses and invest in technology development and commercialization. As a joint OECD-New Partnership for Africa's Development report has noted, developing nations often lack the deep equity markets and financing

<sup>5</sup> Federation of Indian Chambers of Commerce and Industry and Ernst & Young. 2012. *Accelerating Public Private Partnerships in India*. Available at: [http://www.ey.com/publication/vwluassets/ey-public-private-partnership-the-next-continuum/\\$file/ey-public-private-partnership-the-next-continuum.pdf](http://www.ey.com/publication/vwluassets/ey-public-private-partnership-the-next-continuum/$file/ey-public-private-partnership-the-next-continuum.pdf).

<sup>6</sup> PricewaterhouseCoopers. *OpCit*.

opportunities that are necessary to attract “high-tech or innovative firms.”<sup>7</sup>

- **Trained and Talented Workforce:** Innovation in high technology also requires consistent investments in education, particularly advanced research institutions, and ongoing training for the workforce, as well as putting in place an effective expatriate tax regime and visa policies that encourage the immigration of skilled foreign workers.<sup>8</sup> As a case study by the Inter-American Development Bank noted, investments in worker education and training can have a substantial impact on innovation and knowledge transfer throughout an economy more broadly.<sup>9</sup> These and other policies need to address varying skill levels, from high-technology

<sup>7</sup> Dahou, K et al. 2009. *Deepening African Financial Markets for Growth and Investment*. NEPAD-OECD Africa Investment Initiative Background Paper. Available at:

<http://www.oecd.org/investment/investmentfordvelopment/43966839.pdf>. See also:

PricewaterhouseCoopers. *OpCit*. (“FDI supports a country’s transition from an early stage of importing and adopting innovation created elsewhere to the next stage of enabling the local market to achieve its own level of sustained domestic innovation.”)

<sup>8</sup> See for example: Deloitte. 2014. *2014 Global Survey of R&D Tax Incentive*. Available at: <http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-global-rd-survey-aug-2014.pdf>.

<sup>9</sup> Júnior, SK. et al. 2014. *Productive Development Policies and Innovation Spillovers through Labor Force Mobility: The Case of the Brazilian Innovation Support System*. IDB Working Paper Series; 459. Available at: <https://publications.iadb.org/bitstream/handle/11319/4682/Productive%20Development%20Policies%20and%20Innovation%20Spillovers%20through%20Labor%20Force%20Mobility%3a%20The%20Case%20of%20the%20Brazilian%20Innovation%20Support%20System.pdf;jsessionid=0E58AF9118F8E26D96A3785C69BDA1A0?sequence=1>.

engineering to welders, electricians, maintenance, and operational personnel, as well as capable regulatory officials. In many instances, partnerships between local education institutions and the private sector have been a successful tool as well, encouraging and enabling the development of local talent and access to advanced education.<sup>10</sup>

- **Intellectual Property Rights:** Finally, IPRs serve as a fundamental catalyst of innovation, underpinning the effectiveness of the other enabling factors mentioned above. Without a mechanism for innovators to benefit from their breakthroughs and protect the fruits of their efforts, it can be challenging to advance technologies necessary to address climate change or disseminate them. IPRs are part of the solution as industry's practical experience and a wide range of academic literature makes clear.<sup>11</sup> The

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<sup>10</sup> Patrinos, HA. *et al.* 2009. *The Role and Impact of Public-Private Partnerships in Education*. The World Bank. Available at: <http://elibrary.worldbank.org/doi/abs/10.1596/978-0-8213-7866-3>.

<sup>11</sup> See for example: Lybecker, KM & Lohse, S. 2015 *Innovation and Diffusion of Green Technologies: The Role of Intellectual Property and Other Enabling Factors*. Global Challenges Report. World Intellectual Property Organization. Available at: [http://www.wipo.int/edocs/pubdocs/en/wipo\\_rep\\_gc\\_2015\\_1.pdf](http://www.wipo.int/edocs/pubdocs/en/wipo_rep_gc_2015_1.pdf);

U.N. Conference on Trade and Development. 2011. Foreign direct investment, the transfer and diffusion of technology, and sustainable development. Available at: [http://unctad.org/en/docs/ciiem2d2\\_en.pdf](http://unctad.org/en/docs/ciiem2d2_en.pdf); Johnson, DKN & Lybecker, KM. 2009. *Innovating for an Uncertain Market: A Literature Review of the Constraints on Environmental Innovation*. Colorado College Working Paper 2009-06. Available at: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1454882](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1454882);

PwC innovation survey cited above, for example, concluded that countries with weaker institutions supporting IPR tend to lag in innovation and instead rely on lower-cost labour to remain competitive.<sup>12</sup> Weakening the existing IPR framework of the WTO's Agreement on Trade-Related Intellectual Property Rights through international agreements or otherwise would seriously undermine incentives to innovate, including investments by firms in essential research capabilities, and lead to greater uncertainty as well as higher costs of developing, adapting, and disseminating technology. In the presence of increased uncertainty, capital allocation may shift towards more reliable and less innovative investments. It is also desirable to improve developing country access to advanced technologies by using the technology and financial mechanisms established by the UNFCCC to accelerate commercial uptake in these countries.

## Conclusion

The private sector will continue to serve as the key incubator for innovation and technology advancement. However, governments can foster and incentivize high-technology innovation by putting into place the necessary policies and

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Newell, R. 2008. *International Climate Technology Strategies*. Harvard Project on Int'l Climate Agreements. Discussion Paper 08-12; Park, WG & Lippoldt, DC. 2008. *Technology Transfer and the Economic Implications of the Strengthening of Intellectual Property Rights in Developing Countries*. OECD Trade Committee. Policy Working Paper No. 62; and UNFCCC. 2003. *Enabling Environments for Technology Transfer*. Available at: <http://unfccc.int/resource/docs/tp/tp0302.pdf>.

<sup>12</sup> PricewaterhouseCoopers. *OpCit*.

practices to incentivize innovation and move their nations up the innovation and technology value chain. While some policies and initiatives are specific to

encouraging innovation in low-emissions technology, there is also a broad toolkit of pro-innovation policy that will have wider benefits.

Advanced Manufacturing Coalition for Technology & Innovation

The Australia Industry Group

BusinessEurope

BusinessNZ

Confederation of British Industry

Dansk Industri

Federation of German Industries – BDI

Iniciativa para el Desarrollo Ambiental y Sostenible — IDEAS (Mexico)

Mouvement des Entreprises de France

Keidanren Japan Business Federation

TÜSİAD—Turkish Industry and Business Association

U.S. Chamber of Commerce Institute for 21st Century Energy

U.S. Council for International Business

## **ABOUT BizMEF**

BizMEF is a voluntary coalition of major multi-sectoral business organizations from major economies. Modeled after the government-to-government Major Economies Forum, BizMEF is a platform for these groups to:

- promote dialogue and exchange views on climate change and energy security across a broad spectrum of business interests including major developed, emerging, and developing economies;
- highlight areas of agreement among participating organizations on the most important issues for business in international climate change policy forums; and
- share these views with governments, international bodies, other business organizations, the press, and the public.

Organizations that have participated in BizMEF meetings represent business groups in Australia, Brazil, Canada, China, the European Union, Denmark, France, Germany, India, Italy, Japan, Mexico, New Zealand, South Africa, South Korea, Turkey, the United Kingdom, and the United States. Collectively, BizMEF organizations represent more than 25 million businesses of every size and sector. Because BizMEF partnering organizations represent a broad range of companies and industries—including energy producing and consuming companies as well as energy technology and service providers—the partnership is able to provide robust and balanced views on a range of issues. For more information on BizMEF, please visit our website at: [www.majoreconomiesbusinessforum.org](http://www.majoreconomiesbusinessforum.org).