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Commission on Science and Technology  
for Development  
(CSTD)  
Background guide

# Table of contents

Table of contents .....	2
Introduction to the Committee .....	3
History of the Committee .....	3
Topic A: Developing Sustainability .....	4
Statement of the Problem.....	4
History of the Problem .....	5
Current Situation.....	8
Proposed Solutions.....	13
Questions a resolution must answer:.....	15
Bloc Positions .....	16
Suggestions for further research:.....	17
Topic B: A more connected world .....	18
Statement of the Problem: .....	18
Current Situation:.....	21
Relevant UN Actions: .....	25
Proposed solutions:.....	25
Questions a Resolution Must Answer .....	27
Bloc Positions .....	27
Suggestions for further research:.....	29
Bibliography: .....	31

## Introduction to the Committee

On this committee, you will be discussing and thinking about how science and technology can be used to solve the world's most pressing problems. You will be considering how technology can be used to solve and simplify specific problems, how that technology can be implemented and how technology interacts with different social and cultural environments. This will require you to think in an interdisciplinary manner. The CTSD's mandate is to promote science and technology as potential solutions to developmental problems.

Climate change is arguably the greatest developmental problem facing the world and it requires immediate and comprehensive action to solve. On the CTSD, you can explore how science and technology can be used to make the necessary adjustments as easily and as inexpensively as possible. The second topic will allow you to explore how information and communications technologies can be used as a potent tool for development. The particular power of mobile technology is that it has allowed developing countries to "leapfrog" over landline technology, thus leading to more rapid growth than would have otherwise occurred. This should make you consider how new information and communication technologies can accelerate development.

## History of the Committee

In 1979, the UN held a conference on Science and Technology for development in Vienna creating an intergovernmental committee. This committee was made a functional commission of the Economic and Social Council (ECOSOC) in 1992, forming the Committee for Science and Technology for Development (CTSD). It was created to provide "analysis and policy recommendations" to the UN on the advances made in science and technology and the ramifications that they have for development. Following the World Summit on the Information Society in 2006, it has been mandated by the ECOSOC to be the "focal point" of the "system wide follow up" to the resolutions made during the summit.

One of the key goals of the summit was to respond to the growing digital divide between the developed and developing world. Hence, the committee's historical role is directly connected to our second topic. The ECOSOC has passed resolutions allowing private sector entities, civil society entities and NGOs to participate in CTSD sessions. This emphasises that the problems raised by our two topics can only be resolved through the co-operation of every facet of society. Throughout its history, ECOSOC resolutions have consistently emphasised the role of the CTSD in working to ensure that Science and Technology serve as enablers for developmental goals. Thus, the CTSD is best understood as one cog in a larger machine working to achieve the UN SDGs.

Most importantly, the CTSD has recently released an updated policy review framework as to how development objectives should be met<sup>1</sup>.

## Topic A: Developing Sustainability

### Statement of the Problem

Climate change is indisputably the largest threat facing humanity. Thus far, human activity has caused an increase of 1.0 degrees Celsius in Global temperatures, a value that is estimated to increase to 1.5 degrees Celsius between 2032-2050 if emissions continue at their present rate. This has begun to cause and will continue to cause an increase in flooding, drought, extreme weather and ecosystem damage. Limiting temperature increase to 1.5 degrees Celsius will “require rapid, far-reaching and unprecedented changes in all aspects of society”<sup>2</sup> and so too will mitigating the effects of existing temperature increases. Advancing human development is one of the UN's founding principles<sup>3</sup> and work to achieve that goal has been one of humanity's greatest successes in in the last 30 years.

Since 1990, more than 1 billion people have been lifted out of extreme poverty. However, 10% of humanity still belongs to this category; it would be a severe mistake to consider us to have achieved our end goal<sup>3</sup>. A recent Bloomberg report has shown that in 1/3 of the world, it is cheaper to add energy capacity using fossil fuels than their renewable alternatives<sup>4</sup>. This coupled with

transitioning existing energy capacity from fossil fuels constitutes a trade-off between lifting more people out of poverty and securing humanity's future. This trade-off is an enormously complex ethical dilemma. The more that science and technology reduces the cost of renewable energy and the more the transition to it is facilitated, the less we have to consider the ramifications of this dilemma.

## History of the Problem

### **A timeline of international response to climate change:**

In June 1988, NASA scientist James E. Hansen testified before US congress with “99 percent” certainty that rising temperatures could be attributed to the build-up of carbon dioxide and other gases in the atmosphere<sup>5</sup>. This heralded the beginning of the UN's response to the problem. In November of that year the World Meteorological Organisation (WMO) and the UN Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC), an organisation whose reports have provided the scientific framework under which international negotiations have taken place in subsequent decades. In 1990, the IPCC issued its first assessment report, concluding that “emissions resulting from human activities are substantially increasing the atmospheric concentrations of greenhouse gases”. In December of that year, the UN General Assembly established the Intergovernmental Negotiating Committee (INC) to form a Convention on climate change. The INC held five sessions involving over 150 states, where it discussed “binding commitments, targets and timetables for emissions reductions, financial mechanisms, technology transfer, and 'common but differentiated' responsibilities of developed and developing countries.” The final point highlights the relevance of developmental considerations when delegating responsibility for climate change, emphasising the historical need to view the two issues in light of one another.

The convention was adopted in the May of 1992 and in the June of that year the UNFCCC opened for signature at the Rio Earth summit. It came into effect in 1994, agreeing that its signatories would meet on a yearly basis at the conference of parties (COP) to discuss various mean of

combatting climate change. The first conference of the parties took place in 1995. It was agreed that the commitments made in the INC convention were “inadequate”<sup>6</sup> to achieve the objectives that it had set out. The so-called “Berlin mandate”<sup>7</sup> revised the convention and attempted to create mechanisms by which greater commitments could be made by developed countries. This provided the foundation for the Kyoto Protocol of 1997, the first treaty to agree to reduction in greenhouse gas emissions. Subsequent conferences in Bonn and Marrakesh sought to both establish an “operational rulebook” for the Kyoto Protocol and to ratify it. After years of work, in 2005 the Kyoto Protocol entered into force following its ratification by the Russian Federation. In the same year, the EU launched the world’s first emissions trading scheme, a scheme responsible for approximately half of the EU’s emissions reductions<sup>8</sup>. These two events exhibit an emerging global recognition of climate change as a policy priority.

In 2006, the clean development mechanism opened, a crucial historical development in the battle against global warming. It “allows a country with an emission-reduction or emission- limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO<sub>2</sub>, which can be counted towards meeting Kyoto targets.”<sup>9</sup>. This scheme provides an incentive for signatories to help contribute to sustainable energy development, thus allowing them to subsidise transition to cleaner forms of energy that might otherwise curtail growth and increases in living standards. In 2006, the Subsidiary Body for Scientific and Technological Advice (SBSTA) was mandated to “address impacts vulnerability and adaptation to climate change”<sup>10</sup>.

In 2009, the Copenhagen accord established so called “fast start finance”; investments “provided by developed countries, global corporations, banks, and private lenders” to help combat climate change. A crucial step in equipping developing countries to combat climate change took place in 2010. The Cancun agreements established the Green Climate Fund<sup>12</sup>, the Technology mechanism<sup>13</sup>

and the Cancun adaption framework<sup>14</sup>, an initiative designed to reduce vulnerability and enhance action on adaptation in developing countries.

Important developments were made in Doha in 2012, where the foundations were laid for the 2015 Paris Climate Agreement and the so called “Doha Amendment” introduced a second commitment period for the Kyoto Protocol<sup>15</sup>. “The Paris Agreement represents a major milestone in efforts to curb emissions and for the first time brought all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so”. In recent years, conferences in Marrakesh, Paris and Katowice have worked on implementing the agreement and providing financial support to achieve its goals. In recent years, a series of climate strikes and the emergence of activists like Greta Thunberg and initiatives like Extinction Rebellion have helped to further embed the threat of climate change into the public consciousness.

### **A timeline of international co-ordination on development:**

International development was established as a central purpose of the UN in its charter, which aims “To help nations work together to improve the lives of poor people, to conquer hunger, disease and illiteracy, and to encourage respect for each other’s rights and freedoms”<sup>16</sup>. Indeed, it is regarded as one of the UN’s four primary goals to this day<sup>17</sup>.

In an effort to accelerate development efforts, the UN implemented the Millennium Development goals in the year 2000. By 2015 the UN had aimed to: “eradicate extreme poverty and hunger; to achieve universal primary education; to promote gender equality and empower women; to reduce child mortality; to improve maternal health; to combat HIV/AIDS, malaria, and other diseases; to ensure environmental sustainability; and to develop a global partnership for development”<sup>18</sup>. In the same year as the Paris Climate agreement was signed, the UN critically assessed its progress in achieving the goals that it had set out fifteen years earlier. The MDGs constituted the “most successful anti- poverty movement in history”. Between 2000 and 2015, the global percentage of people living in extreme poverty fell from 50% to 14% and some advances were made on every



MDG<sup>19</sup>. However, some goals were considerably closer to being achieved than others. This fact coupled with the urgency required to prevent climate change necessitated a re-evaluation of the UN's developmental priorities. It is for this reason that in 2015 the UN released its sustainable development goals that it aims to achieve by 2030. Focuses shifted towards issues concerning the climate, with climate action, affordable and clean energy, life below water and life on land being 4 of the 17 goals<sup>20</sup>. Furthermore, the idea of sustainable development as opposed to development simpliciter captures the core dilemma of the topic: What good is development now if our work is undone by climate change?

### **Conclusion:**

We are at a turning point in the history of our topic, representing a concrete recognition of the impact that development and climate change can have on one another respectively. It is believed by some that any attempt to mitigate climate change while fossil fuels are cheaper than renewable energy will necessarily stunt development.

However, it is not clear that this is true, as we will detail in the next section.

Furthermore, even if it were true, thanks to falling renewable energy prices and enormous scientific and technological research, the severity of this trade off may not be especially severe if the international community takes appropriate action.

## Current Situation

### **The Climate:**

As of 2019, “climate change is occurring much faster than anticipated”<sup>21</sup>. If the worst effects of climate change are to be avoided, temperature increase must be capped at 1.5 degrees Celsius. If this is to be done, it will require “unprecedented changes in all aspects of society”<sup>21</sup>. In fact, global carbon emissions would need to be cut by 45% by 2030 and reach 0% by 2050 for this to happen<sup>21</sup>. Furthermore, climate change is beginning to manifest itself in a global increase in natural disasters, often in developing countries that are least able to deal with their effects, costing

nearly 2.4 trillion USD in 2019 alone<sup>21</sup>. This has led many governments to begin investment in alleviating disaster risk, accepting the damage that climate change has done and is likely to do. Although more capital is being directed towards reducing emissions, this investment is dwarfed by the scope of the problem and the rate of investment in fossil fuels which it continues to be surpassed by. The enormous impact of climate change on the Earth's atmosphere and geography means that it effects every other sustainable development goal in a seismic manner.

In terms of the most famous SDG, the 2023 report found that the number of people living in extreme poverty had increased from in the past few years. As it stands, the world is not on track to eliminate climate change or extreme poverty in line with the goals declared in the SDGs. If there exists any sort of trade-off between economic growth and curbing emissions, this leaves developing countries with the choice between bringing their citizens out of poverty and meeting emissions targets. Given high levels of inequality across the world and given the relative contributions made to emissions across the last 200 years, developing countries will feel aggrieved and seek assistance and subsidisation in meeting emissions goals. Equally, many developed countries are facing increasingly isolationist voters that are dealing with new and complex challenges. Many of these citizens are unlikely to be friendly to the idea of subsidising and assisting developing countries. The challenge that the UN faces in achieving its goals is facilitating international compromise and collaboration in a way that is perceived as being universally beneficial and participative. The UN has to resolve a wide assortment of national priorities, geopolitical tensions as well as historical grievances if it is to solve the all- important issue of climate change.

Taking a step back from the challenges that face the UN, the World Economic Forum has produced a framework with which to consider competing narratives describing the future of the world's climate. They argue that there are two primary narratives: The Gradual Change Narrative and The Rapid Change Narrative. Gradual Change advocates argue that "the energy world of tomorrow will look very much like the energy world of today", arguing that little about our consumption will change and that we will fail to meet the targets proposed in the Paris Agreement. Rapid Change advocates argue that new energy technologies are the source of all new growth in our energy supply and that "current technologies and new policies will reshape markets". It is no exaggeration

to say that the future of humanity and of life on earth hinges about which of these two competing narratives comes to pass. Furthermore, as one might expect, the answer to this question depends on a wide assortment of variables. As if the problem were not complex enough, one of these variables is which narrative that the majority of people believe will take place. If people believe that the energy market will remain the same, they will continue to invest and behave as they are now, preventing change from occurring. In contrast, if they believe that disruptive green technologies will prove successful, they will divest from fossil fuels and invest in sustainable energy; an act that when iterated across the global economy will lead to the sort of “unprecedented change” needed to prevent climate disaster. This sort of change needs to happen soon. Only 16 countries have laid out emissions plans consistent with the commitments that they made in the Paris agreement.<sup>22</sup>

### **Established norms and technological adoption and transition:**

A recent report has shown that the cost of solar and wind energy is likely to be lower than fossil fuels across the world by 2020, meaning that it is crucial that any barriers to their adoption are removed.<sup>4</sup> Firms in the developed world may be able to adopt these technologies, but firms in developing countries may have “low absorptive capacities”, meaning that there are other costs associated with implementing sustainable technology. For example, significant expertise might be needed to install and maintain such technology in a given industry. Furthermore, it is important to recognise the importance of “socio-technical pathways”; the fact that a disruptive technology is cheaper than an established technology does not guarantee its adoption. Ecosystems emerge where socio-economic behaviour and technology are dependent on one another, meaning that adopting new technologies often depends on factors other than cost. Indeed, “different countries’ interacting social, technological and ecological systems have co-evolved in historically- contingent and politically-directed pathways which act to constrain future possibilities”<sup>23</sup>. Hence, any attempts to aid transition from fossil fuels to sustainable energy sources in developing countries must take acknowledge and take advantage of existing relationships between society and technology.

## **Assessing the problem:**

When we think about making the world's energy consumption emissions free, we have to consider two components of energy demand, existing demand and new demand. We have to consider how we transition from fossil fuels to sustainable ones as well as ensuring that any new demand added is met with green energy supply. It is important that we do not overlook either aspect. If we cannot transition, then our emissions will not fall meaningfully. Given that global energy demand is expected to increase by 25% by 2040, it is crucial that we secure our future as well as our present. With most of the world's population growth poised to occur in Sub-Saharan Africa, one of the regions that is worst affected by climate change, it is of huge importance that this demand is met and met with sustainable energy<sup>24</sup>. Furthermore, it is believed by many in this region as well as in South America, East Asia and South East Asia that Western Europe and North America has burdened them with climate change through its irresponsibility and failure to combat it. Conversely, Western Europe and North America have often criticised China and India for having high levels of emissions that they fail to consider tackling seriously. The WEF has provided a framework by which countries can move forward on transition, providing an energy transition score that is derived from a "system performance score" and a "transition readiness score". These can be understood loosely as meaning "to what extent is the existing energy system working towards the SDGs?" and "to what extent is the energy system in the process of transitioning towards sustainability?" respectively<sup>25</sup>.

## **Vested interests:**

When it comes to science and technology development and implementation, it is important to remember the power of vested interests at a national and an international level. The centrality of fossil fuels to the world economy gives them considerable power. Simply put, they control the resource that the world runs on. Indeed, the oil and gas drilling sector alone accounted for between 2 and 3 percent of global GDP in 2017<sup>26</sup>. If emissions are to be curbed, the wealth and power of these companies must be channelled in a manner that is conducive to energy transition. Their significant wealth and resources can and should be channelled into research and development on

new forms of energy. Given their considerable lobbying power at both an international and national level, the vested interests that represent fossil fuels cannot be allowed to control the direction of energy policy. It is no coincidence that subsidies for natural gasses amounted to \$5.2 trillion in 2017, 6.5% of global GDP that year<sup>27</sup>. This necessitates adequate regulation that renders them subservient to emissions goals without causing mass economic disruption that might impair some of the other sustainable development goals. If transition is to occur in line with the goals laid out in the Paris agreements, oil producing countries across the world must undergo rapid transitions to more sustainable forms of energy. However, the many countries- most notably OPEC countries and Russia- are hugely dependent on oil both as a means of supporting their economies and as a geopolitical tool. Significant diplomatic as well as ambitious efforts to reduce the power of oligarchs will be required to achieve this. It is crucial that this is done with wide economic consensus from countries across the world. If these efforts are made solely by Western European and North American countries, its likelihood of success falls and is likely to be met with accusations of Western Imperialism under the guise of climate action.

### **International co-ordination:**

A crucial portion of the CTSD's mandate is to help overcome the enormous technological inequality that exists across the world. In the case of technological developments around sustainability, it must firstly be noted that if wealthy countries do not share new technology, it is the poorest parts of the world that will suffer most from environmental damage. Secondly, it must be recognised that if sustainability improvements are not global then we will fail to reach the goals set out in the Paris Agreement. Hence, it is imperative that the international community share its technology. However, many countries will be unwilling to do so, whether out of an unwillingness to lose an edge over a political rival or because of concerns around intellectual property. While both of these concerns have merits, their significance pales when we consider the absolute primacy of climate change as an issue. Hence, the UN has an essential role in ensuring that national interests do not supersede international goals and that the citizens of developing countries are given climate justice.

Equally, it is important to recognise that intellectual property laws and patents provide an incentive for innovation by making the reward of discovering a new technology more profitable. If there is no mechanism by which innovators can profit from the propagation of their technology into developing countries, some will argue that this reduces the incentives to innovate. Once again, it is likely the case that an understanding of trade-offs is key to understanding this topic.

## Proposed Solutions

We might think that the UN has a role to play in subsidising sustainable technologies and providing other incentives to invest in them. However, we can equally imagine such policies leading to what is known as a “Free Rider problem”. Imagine that sustainable firms are certain that they will be invested in because of the government assistance that they avail from. This robs them of any incentive to produce a technology that is widely applicable and that works well. This ultimately costs the world’s economy, leading to mass inefficiency and a decline in growth that will impair our ability to achieve development goals.

This is not to say that policy makers have no role in regulating markets to achieve climate goals. It is merely an illustration that policy makers should be cautious and intelligent in how they implement their policies. It is misguided to think that the best way to curb emissions is to divest entirely from fossil fuels and invest entirely in renewable energy. Such actions would lead to disaster. Hence, climate policy should perform a cost benefit analysis that incorporates all of the SDGs, thus curbing emissions in the least painful way possible.

### **Understanding the private sector:**

Firms are best understood in terms of profit and loss. A firm will invest in something if it is profitable for them to do so. Crucially, a firm will not consider the effect that something it invests in has on anything other than its own profits if it is not regulated to do so. In this sense they can be contrasted with universities and government research groups, bodies which make considerations other than profit and loss. A paradigm example is fossil fuels. Pollution and high levels of emissions are what are known as externalities in economics, they have costs and benefits that do

not affect the party that generated them. Benefits of this kind are known as positive externalities and costs of this kind are known as negative externalities. In the case of climate economics, there is a phenomenon known as “the double externality problem”<sup>28</sup>. When a firm produces a new sustainable technology, it produces two positive externalities. The first is the benefit of there being a new technology that other firms and individuals can use.

The second is the benefit of there being a technology that reduces carbon emissions, further benefiting society by reducing the social cost of pollution. The problem at hand is that because neither of these benefits affect firms that create them, firms have no economic incentive to produce new green technology at a rate that is optimal for society. Theoretically, the way of solving this problem is often described as “internalising the externality”. We have to force firms to produce technology at the rate that is optimal for society. This is sometimes done using a tax on the externality (also known as a Pigouvian tax) but it can also be done via other forms of regulation. The challenge is evaluating what sort of regulation this might be.

### **Smart Policy:**

Advancing the progress of science and creating technologies in the first place requires collaboration and input from every facet of society. Firms and academic institutions will perform their own research and development independently of governments.

However, the research of different institutions with different priorities is not always conducive to solving a large scale, complex problem like climate change. The objective of governments and NGOs is to co-ordinate these various institutions, encouraging them to work together and providing them with incentives to work towards developing widely applicable and cheap technologies that will reduce emissions<sup>18</sup>. The challenge that these bodies face in their efforts to do so is that changes to the economic structures around innovation may have unintended consequences on existing incentives to innovate. If governments and NGOs are to make successful changes, they must consider at length why innovation does or does not occur in various societies, while looking to success stories and research for a way of solving existing problems or retaining

existing benefits. Governments have a wide range of policy tools at their disposal, including subsidies, tax credits, different types of emission taxes, government committees and task forces to name but a few<sup>18</sup>. The key is that governments use these tools wisely with an adequate understanding of whether or not the tool in question will lead to a more desirable outcome than the existing one. However well-intentioned a policy, it must be remembered that the only criterion by which a policy should be considered is whether or not it works. This can create challenges when portraying certain policies to members of government who are subservient to their voters, whose wills may be swayed by the effectiveness with which policy is marketed.

## Questions a resolution must answer:

A resolution should discuss but need not be limited to:

- Does the CTSD believe that there is a necessary trade-off between curbing emissions in line with the Paris agreement and continued international development? If so, does the CTSD recommend that developed countries subsidise developing countries in their efforts to curb emissions?
- How does the CTSD recommend the international community go about enforcing the Paris Agreement?
- How does the CTSD recommend that the UN combat vested interests at both a National and International Level that are impairing our ability to meet the goals established in the Paris Agreement?
- How does the CTSD recommend the UN regulate the fossil fuels industry so as to facilitate transition to emissions free energy?
- What sort of action does the CTSD recommend in order to promote the development of sustainable technology from the ground up?



## Bloc Positions

On such a multi-faceted issue, it is difficult to precisely define blocs. We have used level of development and CCPI (Climate Change Performance Index) for 2019 to group countries together.

### **Countries not included in the CCPI (Climate Change Performance Index):**

These countries are predominantly in Sub-Saharan Africa, Western South America, South East Asia and the Middle East. They are the world's poorest countries and some of the most vulnerable to climate change. These countries will be desperate for developed nations to subsidise and aid their efforts to combat climate change without compromising development and will argue that it is their moral responsibility to do so.

### **Developing countries with a high to medium CCPI:**

These are the countries that are doing the most to combat climate change with the fewest resources. They will be intent on ensuring that their more developed counterparts do their bit and will be keen to share insights with other developing countries.

### **Developing countries with low CCPI:**

These nations will be likely to point the finger at developed countries with low CCPI in an effort to deflect criticism. In order to achieve their compliance, it is crucial that they are given as few excuses as possible to have a low CCPI. This means reducing the trade-off between raising it and improving living standards.

### **Developed countries with a high CCPI:**

These countries will be intent on making their developed counterparts raise their CCPI so as to facilitate further international collaboration.

### **Developed countries with a low CCPI:**

These nations will be met with the least sympathy from the international community. They may be facing electorates that will perceive efforts to combat climate change as a distraction from more pressing issues at home. It is crucial that they are made to raise their CCPI and to share technology and investment if we are to solve the problem at hand. It is also crucial that this is done in such a way that it can be marketed to their electorates as fair, equitable and consistent with their national sovereignty<sup>29</sup>.

### **Suggestions for further research:**

You should firstly ensure that you understand everything in this document. If you find anything difficult to understand, don't worry. This is complex stuff. For help, read through the bibliography and visit the various websites and sources that you can access. The UNFCCC timeline is a useful gateway to historically important documents around the history of climate change. Bloomberg NEF provides excellent analysis on energy trends around the world. I would recommend that you sign up for their newsletter and read any articles that seem relevant to the topic at hand. I would recommend reading the WEF document on Rapid or Gradual change as it provides a useful framework for understanding the broad problems involved in finding solutions to these problems. Given the changing mood and growing sense of urgency around climate change, the facts may be different by the time of the conference. Hence, it's best to keep up to date with any news or developments on the issue as they happen. The most important thing isn't that you read a lot. It isn't even what you read. It's that you read something and that you read it critically, thinking about the perspective that your country has on the issue while thinking about how feasible it is.

## Topic B: A more connected world

### Statement of the Problem:

In the last number of decades, a quiet revolution has been underway. Mobile phones have become ubiquitous in developing countries. Indeed, mobile phone subscriptions increased from less than 20 people per 100 to nearly 99 per 100 between 2001 and 2017<sup>1</sup>. This provides us with exciting new opportunities for development across the world. The increased adoption of mobile phones means that information travels more quickly across and within countries, leading to improved economic efficiency and productivity, thus contributing to growth and taking more of the world's poorest out of poverty. Simply put, increased mobile phone ownership gives more people access to the digital economy, an integral part of today's global economy. It has allowed developing countries to "leapfrog" to a later stage of development than they might have been able to achieve.

Furthermore, mobile phones enable access to mobile money. Evidence suggests that this has hugely positive effects on poverty reduction, especially on female-headed households. This suggests that mobile phones have an enormous role to play not only in ending poverty but also in ending gender inequality. Given that both of these are SDGs and that the digital economy is becoming only more crucial to the global economy, it is a clear imperative that the UN learn from and continue the mobile phone revolution. It can use this knowledge to evaluate the importance and potential utility of other telecommunications-based technologies.

### Telecoms, mobile and their existing applications in development:

#### **An overview:**

The first mobile phone was invented in 1984, costing over \$4,000 and requiring a 10 hour charge for 30 minutes of use<sup>2</sup>. From 1970 to 1990, any telecommunications networks that existed in developing countries were almost entirely fixed networks that did not avail of mobile technology. Networks like these are complex, expensive and require large amounts of infrastructure to develop and maintain. When we examine where growth has taken place in telecommunications networks in the last 40 years, the importance of mobile phones is evident. Mobile phone infrastructure costs

less and is faster to implement than landlines. Hence, they have been adopted by the citizens of developing countries, allowing them to bypass the landline component of their development and to progress directly to using mobile phones. Furthermore, they are easier to utilise in economies of varying size because there is less of a need for large scale infrastructure.

The case of Morocco is a paradigm example of this phenomenon. In 1995, telecoms penetration rate was around 4 fixed lines per 100 people. In 2003, this penetration rate had increased to 24 per 100 people, with the number of fixed lines remaining constant. Hence, this increase can be attributed entirely to the propagation of mobile technology into Morocco<sup>3</sup>.

Mobile technology has become considerably more advanced in the last number of decades, with lower costs and increases in functionality. Furthermore, economic research has found that mobile phone penetration has led to approximately double the growth in developing countries as it has in developed countries. This gives substance to the idea that telecommunications technology has enabled developing countries to “leapfrog” landline technologies and in doing so accelerate their economic growth.

### **Understanding the role of mobile technology:**

It might not seem obvious why mobile phones play such a large role in increasing levels of economic growth. Mobile phones and telecoms allow information to be transported quickly from one place to another. This in turn allows firms and individuals to reduce transaction costs. For example, they allow individuals to indicate that they have an interest in buying a good remotely rather than them having to travel to meet the buyer. This same ability to rapidly share information allows firms to widen their markets. It has been argued that information in developing countries is often “poor, scarce, maldistributed, inefficiently communicated and intensely valued”.<sup>4</sup> Mobile technology can help reduce these issues around information by facilitating greater capacity for

remote communication. The increased access to internet through mobile technology is also extremely prominent in today's international scenario.

The importance of mobile phones is not isolated to facilitating faster rates of communication. Mobile phones have opened the door to new technologies that facilitate further progress on development, including the growing prominence of mobile banking. In many developing countries, the lack of infrastructure and widely distributed population leave many citizens unable to access banking. The use of mobile technology makes distance comparatively obsolete. M-Pesa used in many African countries and NPCI's Inter Bank Mobile Payment System in India are examples of how developing countries are exploiting mobile technology to promote financial inclusion and to accelerate their development. NPCI has facilitated secure person to person mobile banking as well as providing a wide variety of services to businesses. Mobile banking has been so successful in some developing countries that that they have arguably overtaken most developed countries on this front. This technology does not require internet access to use, meaning that consumers without a smartphone are able to avail of it. This makes its utility in developing countries even more obvious<sup>5</sup>. However, the growth of payment systems that do rely on smartphones also provides challenges. The emergence of the Pix system in Brazil has now included government services and China's use of WeChat and AliPay showcase how smartphones in particular have become central to the participation in local economies.

Many economists believe that telecommunications play a significant role in promoting growth because of the role of what are known as network externalities. Simply put, these occur "when the value of a product to any user is greater the larger the number of users of the same product<sup>6</sup>". The more people that use smartphones, the more people that people who use smart phones are able to contact and the more worthwhile it is to own a smartphone. This gives force to the intuition that mobile phone adoption can occur more easily than landline adoption. Governments paying for landline infrastructure are faced with higher fixed costs. It takes time for the infrastructure to be built and for people to start using it. The infrastructure is more complex and more expensive,

involving building large networks of wires underground – what is known as the last mile problem. Such a government needs to be stable and to be able to pay for something that does not payoff immediately. This will require either the ability to effectively tax its citizens, access to credit or both. All of these things are characteristics that governments in developing countries are less likely to have. In contrast, mobile phone adoption requires far less infrastructure and consequently less of a short-term cost to governments. They rely more so on consumer demand and supply from the private and third sector. The former is available if mobile phones are sufficiently cheap and the latter is available if international firms and NGOs have access to markets in the developing world.

## Current Situation:

### Achieving universal access:

A goal that the UN should aspire towards is to complete the digital revolution and to ensure that the world's poorest are not excluded from the digital economy worldwide. The UN has expressed its commitment to this goal in 2011 when the UN special rapporteur on the promotion and protection of the right to freedom of opinion and expression made a series of recommendations concerning internet access. The scope and extent of these recommendations led it to be reported in the media that UN had effectively classified free internet access as a human right. It is clear that making mobile phone access universal is an important stepping stone in the pursuit of that goal.

Policy makers face a diverse series of problems when trying to improve mobile phone access. First and foremost, it is difficult to accurately assess the extent of the problem because it is difficult to measure the true extent of mobile phone access. The Financial Inclusion Insights (FII) tracker in 2017 found that 80% of respondents said that they had access to a mobile phone where access is defined as “either owning their own phone, sharing a phone, or using a mobile phone that belongs to someone else “. However, if one attempts to measure mobile phone control, defined as “owning a phone, possessing a SIM card and are somewhat or very involved in deciding how the phone is used”, this number falls to 43%. If we are to ensure that citizens in developing countries fully avail

from the socio-economic benefits of mobile phone access, we must ensure that individuals have full access and control over mobile phones. This is especially true if we are to benefit from the empowering effect that mobile access can have on women in developing countries. If we are to solve this problem, we must draw on a wide assortment of development policies.

Science and technology have an important role to play in reducing cost and perhaps even tailoring mobile technologies in such a way as to solve the problems associated with mobile phone control. This problem is of enormous importance if we are to properly harness the power of mobile phone technology in other aspects of development. Some charities have trialled person to person mobile bank transfers. For example, the DREAMS programme provides cash transfers to at risk adolescent girls and young women. If this is to be in any way successful, it is clear that donors will need a high level of certainty that it is in fact the women in question that owns the mobile phone they are transferring to.

As we have mentioned, mobile phone propagation has been so prevalent because of the relatively low infrastructure costs associated with the technology. Indeed, “at the most basic level, mobile phone access is directly tied to the diffusion of cell towers”.

Correspondingly, in areas where it is more difficult to build cell towers because of geography or unrest, cell towers have not been built and mobile phone adoption has been sub-optimal. The UN has a prominent role to play in helping to fund solutions for the development of cell towers and mobile networks in areas where they have been historically neglected. Furthermore, when we think about mobile internet access, many areas are lagging behind. Not even 3G technology has been fully implemented around much of the world. Given that 5G technology is now more and more prevalent in certain areas, it is evident that digital inequality is growing across the world, a problem that the CTSD has emphasised and called on the international community to solve.

Another problem facing citizens of low-income countries is that many governments require that buyers provide some form of national ID card at the point of purchasing a SIM card. This can have

potentially exclusionary consequences for marginalised groups that do not possess national ID cards, potentially affecting the women, ethnic and religious minorities and poorer citizens. This is not even a potential solution to this problem is the existence of some sort of biometric identification system. However, this raises enormous concerns around surveillance and data privacy for citizens. In any case science and technology has a pivotal role in providing solution to this problem, making them affordable and providing potential solutions to the data privacy issues associated with solutions of this kind.

### Emerging applications of mobile technology:

When we consider the number of uses that contemporary mobile phones have, it is immediately obvious that they have transcended their original function. Where they were once person to person communication devices, they are now essentially handheld computers that allow us to access the internet. The CTSD has a pivotal role in evaluating how this technology can be used to help citizens in developing countries that already own a mobile phone. At a CTSD meeting, Premium Hortus was one of five start-ups presented “that have devised innovative and profitable solutions to sustainable development challenges in developing nations and across the globe”. They are an e-commerce company that sell high quality agricultural products to farmers in sub-Saharan Africa. This start-up conveys an important concept.

Telecommunications technologies are powerful because they remove distance and nationality as barriers to trade and commerce. This means that developing countries are able to benefit from the technologies, services and goods of developed countries, thus alleviating inequality. It also means that firms in developed countries are able to benefit from market demand in developing countries, giving them a clear incentive to sell into these sorts of markets.

Where the government has a prominent role in providing infrastructure and regulating market interactions, the market can also have a crucial role to play in facilitating mutually beneficial trades that can reduce international inequality. Mobile technology is not limited to the facilitation



of e-commerce or indeed m-commerce. Another advantage associated with mobile technology is that it acts as a carrier for other technologies. For example, a firm called rAINBOW in South Africa used artificial intelligence to detect the presence of domestic abuse, a threat that one in three women face on a daily basis. rAINBOW is a smart companion that “shares personalised and immersive stories to help those going through the isolating experience of abuse “and helps identify signs of abuse in relationships. From the more obvious ones like sexual and physical signs to others like control, threat, digital and emotional abuse.” However, rAINBOW worked via social media messaging, meaning that the two primary barriers to using it were access to internet and smartphone or computer ownership.

The CTSD has a prominent role to play in assessing, funding and assisting start-ups like Rainbow that have the potential to improve development outcomes.

### Mobile Networks and Data Analytics:

Another important role for the widespread adoption of mobile technology in the developing world is that it has vastly increased the amount of data that local governments and firms have access to. Each time an individual uses their mobile phone they leave some sort of digital fingerprint. The more that individuals use their mobile devices, the more fingerprints that these devices leave and the more data that governments have the potential to access. This has obvious applications in surveillance, marketing, political campaigning and misinformation campaigns.

However, it is important that the CTSD promote technology and research that uses these technologies to serve development goals. If governments have the workforce, technology and computing power, they can analyse this data and use their analysis to solve a wide range of problems. For example, if they know which roads are travelled on the most, they can deploy their resources to improve infrastructure more efficiently. Thus, the presence of mobile networks can be

further exploited to achieve various development goals if governments in developing countries have access to big data analytics.

Sentiance Data (a start-up based in Antwerp) analysed datasets gathered from mobile phone usage to determine the daily routines, habits and characteristics of consumers<sup>10</sup>. It then sold this analysis as a service to firms who can then use this information to specify and improve their marketing strategies. This technology could be applied by governments in developing countries to better understand their citizens and their needs and to implement their resources more effectively. The CTSD can help provide access and dialogue between leaders in developing countries and leaders in the data analytics sector. It can also aid developing countries in providing them with the necessary training to work in this sector. Furthermore, it can fund and promote start-ups that are deemed to be of particular use in solving developmental problems.

### Relevant UN Actions:

The international telecommunications union (ITU) is the UN's specialised agency for information and communication technologies around the world. It works to co-ordinate international collaboration in the telecommunications sector, aiming to develop infrastructure and improve worldwide access to communications technology. They have a major focus on development. Their adoption of the Connected 2030 Agenda, focused on promoting "an information society, empowered by the interconnected world, where telecommunications/ICTs enable and accelerate social, economic and environmentally sustainable growth and development for everyone" as stated on their website and portal. Where the CTSD will critically assess and investigate the capacity for specific technologies and scientific advances in an effort to solve development problems, the ITU's work is centred around the implementation of various technologies in an effort to achieve specific developmental goals.

### Proposed solutions:

The first problem that needs a solution is that not everyone has mobile phone control and that not everyone has internet access. In 2024, approximately 65% of the world's population had internet access and only 43% have mobile control<sup>11</sup>. The UN must ensure that sufficient funding is present at an international and national level to support the growth of these numbers. In approaching this complex task, the UN should look to China as an example. In 2010 China had around 457 million internet users. In 2019 it has over 800 million and 98% of these users are mobile users<sup>12</sup>. This exhibits the sorts of vast improvements that are possible if resources are distributed and organised in the right way. If the UN is to replicate these sorts of improvements across the developing world, it would do well to understand why China has been as successful as it has been in the adoption of mobile internet technology.

The CTSD specifically has an enormous role to play in researching and investigating what factors contributed to this adoption and how they might be applied in other parts of the world. It is important that the UN help provide incentives for mobile phone manufacturers and mobile internet providers to provide cost effective and affordable mobile technology for the world's poorest citizens. It is also important that the UN work to remove disincentives for manufacturers and providers to work in developing countries by working towards political stability and ensuring adherence to fair trade practices.

The second problem that needs a solution is that we are failing to fully exploit the capacity that mobile and internet technology has to help those who already own them. The CTSD must continue to identify start-ups that have developmental applications. It must evaluate if they are profitable and decide whether or not it is worth providing funding to them if they are not. It must assess whether or not a technology is scalable and whether or not it is possible to integrate this technology with existing social and technological networks. Many technologies seem useful and worthy of attention. However, given the complexity of many developmental problems, the CTSD must always bear in mind how this technology will interact with the culture and society that it is being

implemented in. Thus, its work must be deeply interdisciplinary in nature, encompassing a sound understanding of the human and technical sides of developmental problems.

The third problem that needs a solution is that the governments of many developing countries are not fully exploiting the data that mobile networks are providing them with. The CTSD has a role to play in providing developing countries with the resources, technology and training needed to perform sophisticated data analysis. They must also provide insights into how this data can be interpreted and utilised to solve various policy problems and to improve developmental outcomes. Further, they must work to help developing countries overcome and bypass the potential pitfalls that exist when managing large quantities of personal data.

## Questions a Resolution Must Answer

- How should the CTSD improve mobile phone control in the developing world?
- How should the CTSD improve internet access in the developing world?
- How should the CTSD go about identifying and assessing mobile- compatible technologies that have applications in development?
- What specific scientific advances and technologies should the CTSD allocate particular attention to?
- What specific developmental problems should the CTSD focus on finding scientific and technological solutions to?

## Bloc Positions

### **Developing countries with low levels of mobile and internet penetration:**

Countries that have low levels of mobile and internet penetration will desire that the CTSD allocate significant effort and resources to improving mobile and internet access in the developing world.

They will highlight the enormous levels of digital inequality that exist across the world and focus on wanting to prevent an even greater degree of divergence.

They will look to developed and technologically advanced countries to share their expertise, research and wealth. They will also appeal to the large technology companies like Huawei, Facebook and Google by presenting themselves as a new market with millions of potential customers. They will be primarily focused on obtaining more universal mobile access.

### **Developing countries with moderate to high levels of mobile and internet**

**penetration:** These countries will make similar appeals to the CTSD and the international community in general. However, more of their focus will be allocated to ensuring that existing mobile and internet technology is utilised to its fullest capacity for international development. They will be keen to exploit its applications for ecommerce, healthcare and the provision of public services. They will also be intent on developing their AI and machine learning capabilities and we look to the international community for assistance in doing so.

### **China:**

With the advent of the One Belt One Road initiative, the Chinese government will be intent on helping the citizens of developing countries gain access to mobile phones and the internet. It will want to ensure that it is Chinese technology that these citizens are using as the digital revolution expands into the developing world. Hence, they will be willing to provide technology and pay for infrastructure. Their support for initiatives in the field of telecommunications aligns with China's rise as a superpower.

### **Developed countries with near universal mobile and internet access:**

Developed countries will be in two minds about this question. On one hand, they are facing populations that are increasingly unfavourable to the idea of foreign aid. On the other, they will want to prevent China from having huge influence over emerging telecommunications networks.

They will want to make sure that it is American rather than Chinese technology and expertise that is funding developmental efforts. They also be more likely to make aid and funding conditional on a country's governmental structure or human rights record.

Suggestions for further research:

We would recommend that you explore the CTSD website. They often release news and reports discussing the start-ups and technologies they are working with. This can provide you with some insight as to the technologies that are being applied to international development. We would also recommend that you read Phillip Roessler's background paper entitled "The Mobile Phone Revolution and Digital Inequality: Scope, Determinants and Consequences". It was the resource that we found most useful in writing this background guide. It provides a really nice framework for thinking about the social side of IT technologies. If you want to read more about why telecommunications networks are believed to cause economic growth then I would recommend that you read "The Impact of Telecoms on Economic Growth in Developing Countries" by Waverman, Meschi and Fuss. Don't worry if you don't understand it fully, it's a paper written by economists for other economists. We would read through the 2023 SDG report and think about how telecoms or telecoms-based technologies could be deployed to help solve some of them. We want to hear any thoughts or ideas occur to you as you work. Otherwise we would suggest the MIT technology review. It provides great insights into emerging technologies that will spur you on to come up with your own ideas.

## Closing remarks

We hope this background guide introduces the important topics being discussed by CSTD during this session. The delegates should be reminded that the background guide serves as an entry point to research, and we expect them to conduct independent work, particularly in relation to their assigned country positions. In relation to the topics discussed, delegates should remember that CSTD is a science and technology committee, which means that the solutions proposed by the committee must be focused on implementation, advancement of technology and sharing of technology and logistics. Delegates must balance the overall aims of the committee and their own countries' concerns over foreign policy and technological and scientific development. We are looking forward to hearing your insights and solutions to these pressing problems.

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