SDG 6: Target 6.4 Speaker Notes

To accompany the Target 6.4 Slide Deck

- ➔ Slide 1: Today we'll be examining the fourth target associated with sustainable development goal number 6 - to increase water-use efficiency and ensure freshwater supplies.

- ➔ Slide 2: As a quick refresher (or brief introduction) - sustainable development goal 6 is to "ensure availability and sustainable management of water and sanitation for all." Here's a short video highlighting some of the key issues this sustainable development goal addresses. *Play video.*

- ➔ Slide 3: Target 6.4, as stated by the United Nations, is "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity." In the next several slides we'll break down this goal into its key components, and how we can track our progress on this goal.

- ➔ Slide 4: To highlight the severity of just one component of this target - as of 2013, it was projected by the Global Water Institute that "water scarcity could displace 700 million people by 2030." As we'll see in the following slides, the way we use water and manage withdrawals has a tremendous impact on the environment and the population of this planet.

- ➔ Slide 5: Let's look at some data to get a basic understanding of how water use has changed over time globally - then we'll tackle water-use efficiency and sustainable withdrawals. Here, we see data from Our World In Data showing the total amount of water withdrawn globally.

- ➔ Slide 6: Take three minutes to sketch a graph similar to the one on the previous slide (shown again on the right here); but draw divisions between three water-use sectors (agriculture, industry, and domestic). Which sector do you think uses the most water?

- ➔ Slide 7: Here's data from the Food and Agriculture Organization (though note that this data goes up to 2010 rather than 2015); are these divisions between agriculture, industry, and municipalities (domestic) similar to what you drew?

- ➔ Slide 8: Let's break this down a little - how can we actually see if we're increasing water use efficiency and ensuring freshwater supplies for all? Indicators 6.4.1 and 6.4.2! Recall that the UN breaks the SDGS into targets and indicators - target 6.4 is an "Outcome" target, specifying a specific circumstance that we're trying to achieve, and it has these

two associated indicators, which are essentially metrics we can use to measure progress. Let's take a look at each of them, and some examples of these measures.

- ➔ Slide 9: The first indicator is "change in water use efficiency over time." This can be evaluated in a few different ways. On the previous slides, we examined overall global water use over time. Now, to get a sense of how efficiently this water is being used, we can examine the water use in relation to the number of people in a specific area (water use per capita). The key focus of this indicator as defined by the Food and Agricultural Organization, is to "assess the impact of economic growth on the utilization of water resources," (FAO, "Indicator 6.4.1"). Ideally, we want countries to continue to grow and develop their economies, but while also using water sustainably. Essentially, this indicator can be defined as "the value added per water withdrawn," and one way we can evaluate this is in US dollars (or a different currency), per cubic meter of water withdrawn for a given area (FAO, "Indicator 6.4.1"). This metric can provide even more information if we break this down by sector, so we can see how efficiently different sectors are using water over time in a country or region.

- ➔ Slide 10: Let's look at how these metrics can be evaluated at a national level - here's the data for Spain, showing how the water-use per sector is changing over time. Note that the way they organize the data by sectors here: "Agriculture" includes agriculture, forestry, and fishing. "MIMEC" includes: mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; constructions. And "services" includes all the service sectors. The figures allows us to see that the total water-use in Spain decreased from the late 1980s to early 1990s, and has remained fairly constant over the past couple decades.

- ➔ Slide 11: Now that we've seen how water use has varied over time in Spain, let's look at it in the context of how the economy has grown - here we can see the data for water-use efficiency over time. Let's compare the data from 1986 to the data from 2012: this figure shows us that in 1986, on average, 12.39 US dollars were contributed to the economy of Spain (in terms of Gross Value Added, or GVA) for each cubic meter of water used. In 2012 on the other hand, 28.02 US dollars were contributed to the economy of Spain for each cubic meter of water used (which is more than double the 1986 amount). This shows an overall tremendous increase in water-use efficiency in Spain.

- ➔ Slide 12: As noted by the FAO, "2 litres of water are often sufficient for daily drinking purposes but it takes about 3,000 litres to produce the daily food needs of a person."

- ➔ Slide 13: First two metrics address: How much renewable freshwater resources do we have? Then we can get into: What share of freshwater resources do we use?

- ➔ Slide 14: Here's some data from "Our World in Data" showing the renewable freshwater resources available per person, per year, per continent or subcontinent. "Renewable

internal freshwater resources refers to the quantity of internal freshwater from inflowing river basins and recharging groundwater aquifers" (Our World in Data). This data shows that South America has the largest available renewable freshwater resources per person with over 30,000 cubic meters per person per year, which is roughly 119 times more than Northern Africa.

- ➔ Slide 15: To really evaluate indicator 6.4.2 "Level of water stress," we need to examine "freshwater withdrawal as a proportion of available freshwater resources" (the definition of this indicator). Here we see data that captures how much freshwater each country is using, in relation to the total amount available to that country. As you can see, there are several countries that didn't have adequate data for this year; however, for the countries that did - it is apparent that Northern Africa in particular is experiencing extremely high water stress, along with a few other countries.

- ➔ Slide 16: To put this into context - as calculated by UNICEF in 2017, "It is estimated that by 2040, 1 in 4 of the world's children under 18 - some 600 million in all - will be living in areas of extremely high water stress."

- ➔ Slide 17: Another alarming fact is that as of 2020, "3.2 billion people live in agricultural areas with high to very high water shortages or scarcity, of whom 1.2 billion people – roughly one-sixth of the world's population – live in severely water-constrained agricultural areas."

- ➔ Slide 18: In the mid 1900's, Pakistan was rapidly depleting it's available surface water resources attempting to irrigate crops. In the 1970's, farmers began withdrawing groundwater through agricultural wells, improving the irrigation capacity of the country tremendously, and providing a more secure, and predictable annual crop yield. Notably, "the country has the world's largest contiguous irrigation system with almost 80 percent of the cultivated area irrigated."

- ➔ Slide 19:This graph illustrates how the total number of tubewells extracting groundwater from Pakistan dramatically increased over the late 1900s and into the early 2000s.

  Increasing the number of tubewells impacted the country in both positive and negative ways. A key positive to highlight: unrestricted use of groundwater to irrigate crops → initially provided high food and economic security to farmers and communities in Pakistan. However, at a basic level, the more groundwater you pump out of an unconfined aquifer, the more you lower the water table levels → this leads to the need to install deeper wells, which are more expensive to build and operate, thus decreasing the net profit made by the farmers.

  Additionally, when you deplete groundwater resources, the quality of the available groundwater can deteriorate, which can also have a negative impact on the soil of the agricultural land being irrigated, as well as on the overall crop yields.

(Slightly more info: Unsustainable use of groundwater resources has had a variety of negative impacts on the country, including: 1) Drastically lower water table levels → which require deeper, more expensive wells to reach new water levels; 2) The deterioration of groundwater quality, particularly through increasing saltwater intrusion, which then has negative impacts on agriculture: using this groundwater (that now has a higher salinity) to irrigate crops causes soil quality to decline.)

- ➔ Slide 20: The SDG 6 targets are all related to one another in a multitude of ways, and are also related to targets in many of the other sustainable development goals. This graphic depicts the interrelated nature of the targets - for example, when we examine and address water use and scarcity (target 6.4), we ideally take into account the water needed for healthy ecosystems to thrive (target 6.6), while at the same time ensuring access to drinking water for all (target 6.1). And a key element in doing so, is through monitoring and improving our water quality and the way we treat our wastewater (target 6.3). The number of connections between these targets and other targets not shown in this graphic are limitless, emphasizing the importance of collaborations between different experts and stakeholders from many different disciplines and sectors.

- ➔ Slide 21: N/A