








# Natural Resource Use Indicators in the SDGs

For more information, please visit <http://www.unep.org/asiapacificindicators> or contact [janet.salem@unep.org](mailto:janet.salem@unep.org)

SDG Goal	SDG Target	IAEG Indicator <sup>1</sup>	Year 2015	
			Bhutan	Asia-Pacific Developing
<b>6</b> CLEAN WATER AND SANITATION 	6.4 – Increase water-use efficiency	<b>6.4.1 – Water Intensity</b> ( <i>litres per US dollar</i> )	198	220
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	7.2 – Increase share of renewable energy	<b>7.2.1 – Renewable energy</b> share in total primary energy supply <sup>2</sup> ( <i>percentage</i> )	81.6%	18.3%
	7.3 – Improve energy efficiency	<b>7.3.1 Energy Intensity</b> ( <i>megajoules per dollar</i> )	45.5	25.1
<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	8.4 – Resource efficiency and decouple economic growth from environmental degradation	<b>8.4.1 and 12.2.1 – Material Footprint</b>		
		Total ( <i>million tonnes</i> )	9.0	40,728
		Per capita ( <i>tonnes</i> )	11.9	10.8
<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 	12.2 – Sustainable management and efficient use of natural resources	<b>8.4.2 and 12.2.2 – Domestic Material Consumption</b>		
		Total ( <i>million tonnes</i> )	8	47,813
		Per capita ( <i>tonnes</i> )	9.8	12.7
		Per dollar ( <i>Kilograms per dollar</i> )	4.5	5.3
<b>17</b> PARTNERSHIPS FOR THE GOALS 	17.11 – Exports of developing countries	<b>17.11.1 – Developing countries and least developed countries export value</b>		
		Exports ( <i>million dollars</i> )	623	3,189,657
		Exports ( <i>million tonnes</i> )	3.5	2,304
		Unit price of exports ( <i>dollars per kilogram</i> )	0.2	1.4

<sup>1</sup> According to the "Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators", Item 3 (a) of the provisional agenda, Forty-seventh session of the Statistical Commission on 8-11 March 2016 at <http://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-SDGs-Rev1-E.pdf>

<sup>2</sup> Share of Renewables and Hydro of the Total Primary Energy Supply.



# Materials

Materials are the 'things' that make up the products and infrastructure of our society. They include biomass (crops, livestock, forest products, fish), fossil fuels (coal, oil, gas), metals and minerals.

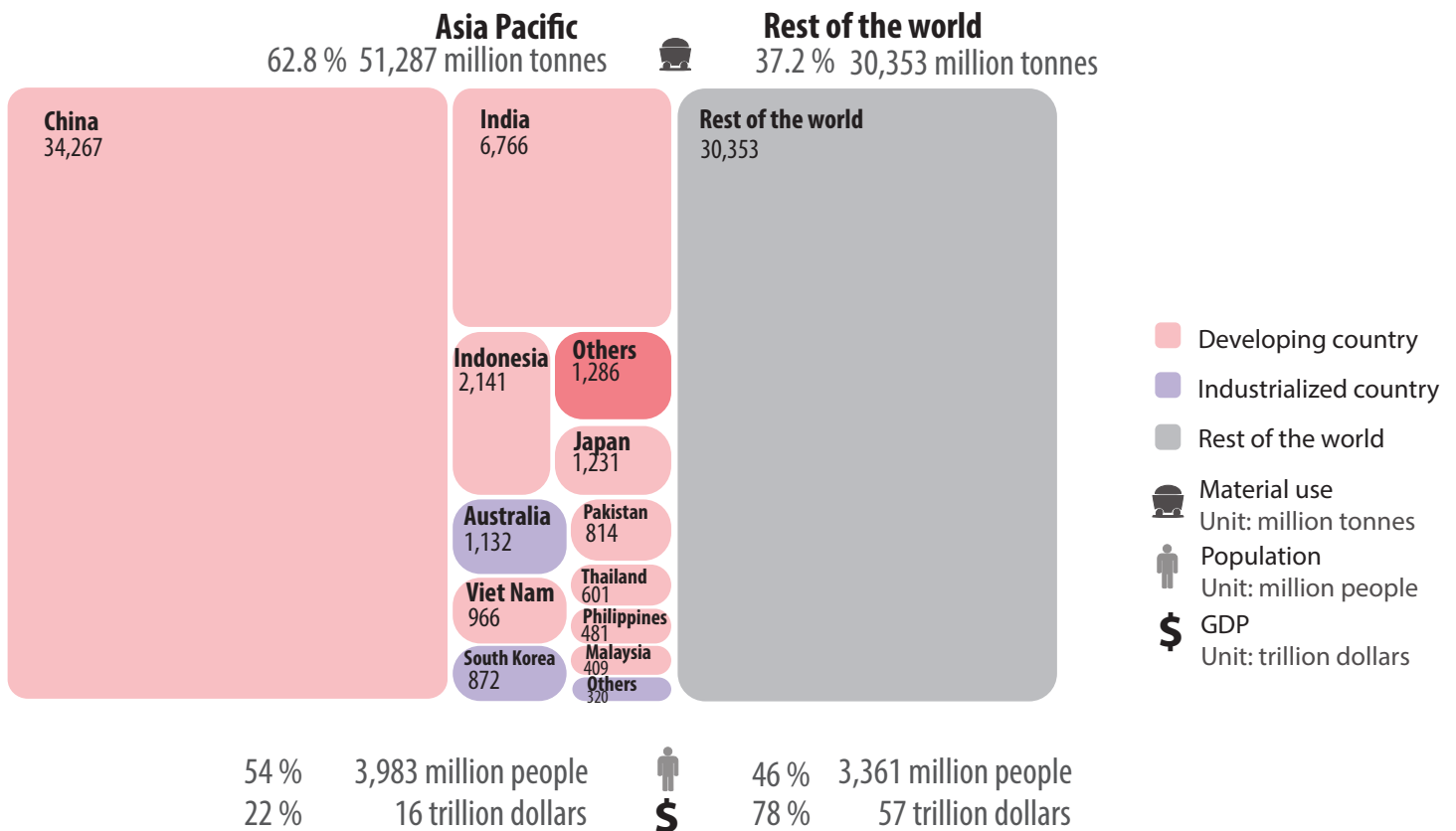
These materials underpin human nutrition and health, fuel energy systems and provide the structural base for buildings, transport networks, vehicles and all consumer goods.

The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Bhutan		Asia-Pacific Developing	
		2010	2015	2010	2015
8.4 – Resource efficiency and decouple economic growth from environmental degradation	<b>8.4.1 and 12.2.1 – Material Footprint</b>				
	Total ( <i>million tonnes</i> )	7	9	28,833	40,729
	Per capita ( <i>tonnes</i> )	9.7	11.9	7.9	10.8
	Per dollar ( <i>Kilograms per dollar</i> )	5.4	5.4	4.4	4.5
12.2 – Sustainable management and efficient use of natural resources	<b>8.4.2 and 12.2.2 – Domestic Material Consumption</b>				
	Total ( <i>million tonnes</i> )	6	8	33,885	47,813
	Per capita ( <i>tonnes</i> )	8	9.8	9.3	12.7
	Per dollar ( <i>Kilograms per dollar</i> )	4.5	4.5	5.2	5.3

## IAEG indicator 12.2.2:

Bhutan has a Domestic Material Consumption of 8 million tonnes of material per year. It grew by 32% between 2010 and 2015.



### IAEG indicator 12.2.1:

Bhutan's Domestic Material Consumption is 8 million tonnes. This consists of 9 million tonnes extracted from its environment plus the 2 million tonnes imported, less 3 million tonnes exported material.

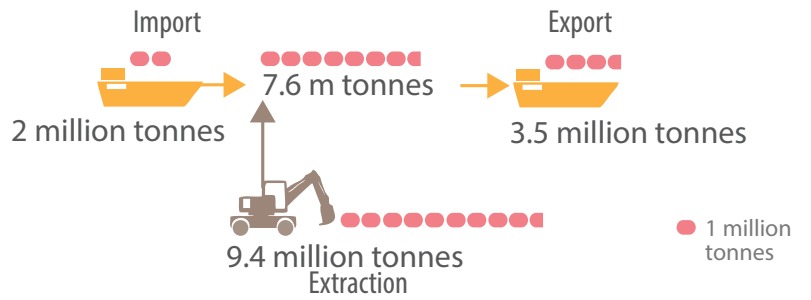
### IAEG indicator 12.2.2:

Bhutan uses 4.5 kilograms per dollar - this is called Material Intensity. It is 15% lower than other developing Asia and Pacific countries.

### IAEG indicator 12.2.1

What about material footprint per capita in 2015?

### Domestic Material Consumption



### Average in the Asia-Pacific

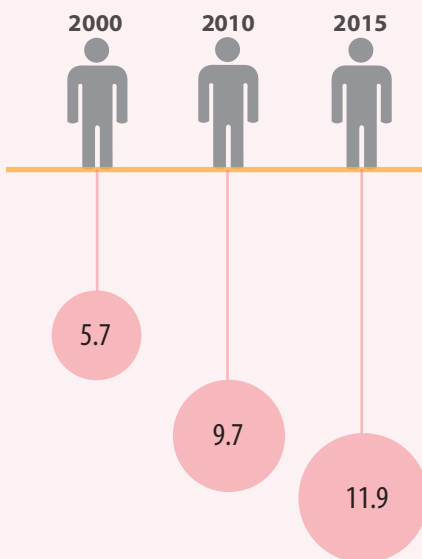
### Bhutan



### The rise of per capita material footprint

(Unit: tonnes per person)

● Material footprint



If we only look at Bhutan's material use for its own consumption, and exclude materials used to make exports, then we have the Material Footprint. For Bhutan, this was 9 million tonnes in 2015, more than its Domestic Material Consumption.

This is 11.9 tonnes per capita per year. It is more than the regional average but grew 22% in the past 5 years alone.

(Unit: tonnes per person)

● Material footprint





## Energy

Energy use is measured with the indicator primary energy supply. This indicator reports the total amount of energy (in joules) available to businesses and households in an economy by summing up domestically produced energy and energy imports and subtracting energy exports. The supply of primary energy may come from different energy sources including coal, petroleum, natural gas, uranium, and renewable energy sources such as hydro, solar and wind. Electricity is only included if it is exported or imported – in all other cases it is derived from one of the energy sources already measured.

### The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Bhutan		Asia-Pacific Developing	
		2010	2015	2010	2015
7.2 – Increase share of renewable energy	7.2.1 – <b>Renewable energy</b> share in total primary energy supply <sup>3</sup> (percentage)	78.3%	81.6%	17.7%	18.32%
7.3 – Improve energy efficiency	7.3.1 – <b>Energy Intensity</b> (Megajoules per dollar)	45.5	45.5	25.0	25.1

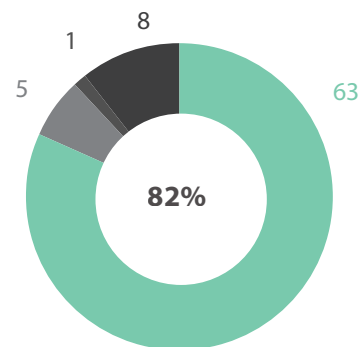
### IAEG indicator 7.2.1:

Bhutan used 78 petajoules of energy in 2015. Of this, 82% was renewable.

1990

2005

2015



Unit: Petajoules



Renewables



Hydro



Natural gas



Petroleum



Coal



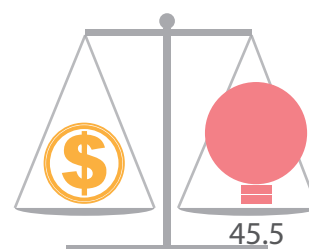
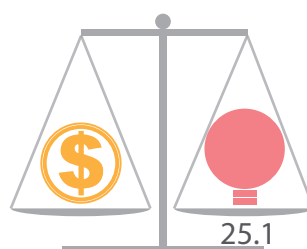
Other

### IAEG indicator 7.3.1:

Bhutan uses 46 megajoules per dollar. This is higher than the regional average.

Average in the Asia-Pacific

Bhutan



Units: Megajoules per dollar

Energy

1 USD

<sup>3</sup>For this report we include "renewables" and "hydro" as renewable energy sources.



## Trade

No country is 100% self sufficient in its resource use. Each country imports products that complement domestic supplies, and exports products to generate export earnings. SDG target 17.11 calls on developing countries to increase their share of global exports, measured in economic value. Countries may wish to monitor the amount of natural resources that are exported as well as the value. This will determine whether developing countries are able to increase their share of exports by adding value to their natural resource exports or by increasing the physical amount of exports.

### The SDGs relevant to materials are:

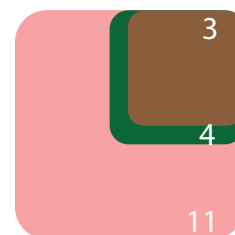
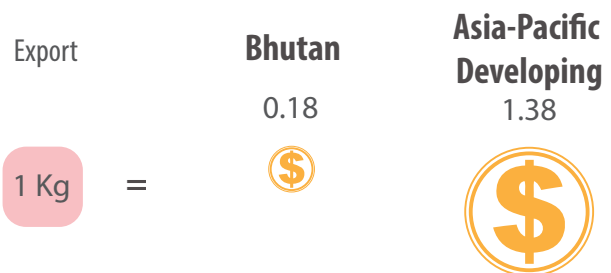
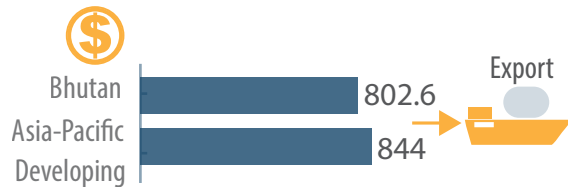
SDG Target	IAEG Indicator	Bhutan		Asia-Pacific Developing	
		2010	2015	2010	2015
17.11 – Exports of developing countries	17.11.1 – Developing countries and least developed countries <b>export value</b>				
	Exports ( <i>million dollars</i> )	520	623	2,299,614	3,189,657
	Exports ( <i>million tonnes</i> )	3	3	1,706	2,305
	Unit price of exports ( <i>dollars per kilogram</i> )	0.2	0.2	1.3	1.4

Bhutan exported 3.5 million tonnes of materials in 2015. On a per capita basis, this is 4477 kilograms per year.

In 2015 the value of exports was \$0.6 billion in total, or \$803 per capita, which was lower than the value for Asia-Pacific developing countries (\$844 per capita).

The unit price for exports was \$0.18 per kg, which is lower than the regional average of \$1.38 per kg.

The Material Footprint of the exports was 4 million tonnes in 2015, which was 40% of materials entering into Bhutan's economy.



- Materials exported:** 3 million tonnes
- Materials needed to produce exports:** 4 million tonnes
- Materials entering Bhutan's economy:** 11 million tonnes



## Water

Unlike other natural resources, water is often reused multiple times in the same year. Furthermore, the great majority of it is extracted from sources which will replenish themselves naturally, via the hydrological cycle, so issues of its usage are really those of managing a renewable resource flow rather than managing a depleting non-renewable resource stock. The water use indicator presented here reports total fresh water abstractions for use in agriculture, industry and in the residential sector, from all surface and underground sources. Direct rain fed onto crops is not included. The total water withdrawals indicator by itself is not an indicator of water stress as it does not include information on the natural availability of water in the region where withdrawals take place.

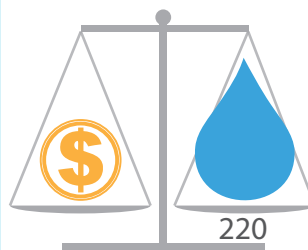
The SDGs relevant to materials are:

SDG Target	IAEG Indicator	Bhutan		Asia-Pacific Developing	
		2010	2015	2010	2015
6.4 – Increase water-use efficiency	6.4.1 – Water Intensity ( <i>litres per US dollar</i> )	262	198	304	220

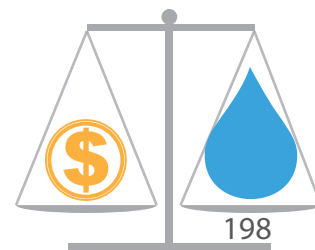
### IAEG indicator 6.4.1:

Bhutan used 198 liters of water per dollar GDP in 2015. This is less than the regional average (220 liters per dollar).



Average in the Asia-Pacific



Bhutan



Units: litres per dollar

 Water  
 1 USD

### Want to know more information?

Indicators for Resource Efficient and Green Asia

<http://www.unep.org/asiapacificindicators>

Indicators data

<http://uneplive.unep.org/>

UNEP

[www.unep.org](http://www.unep.org)

SWITCH-Asia

<http://www.switch-asia.eu/news/indicators-for-a-resource-efficient-and-green-asia-and-the-pacific>



With the support of the SWITCH-Asia Programme of the European Union

### For further information please contact:

Janet Salem

Programme Officer, UNEP

Bangkok, Thailand

[janet.salem@unep.org](mailto:janet.salem@unep.org)