Circular Economy with Focus on Plastic Wastes

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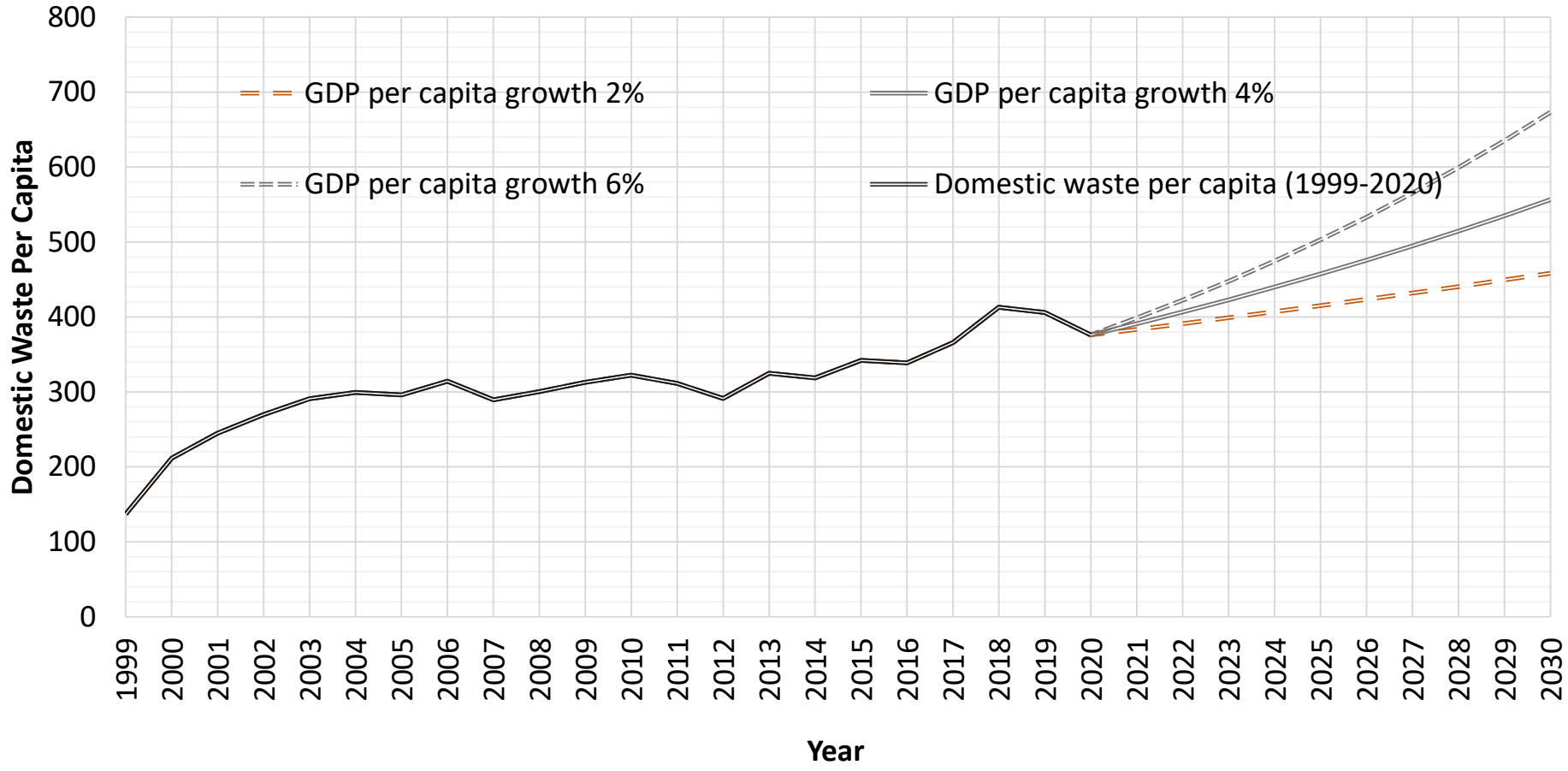
Plastic free Mauritius: Defining the Roadmap

Consultative Workshop & Expo-Vente on Plastic at
Caudan Art Centre

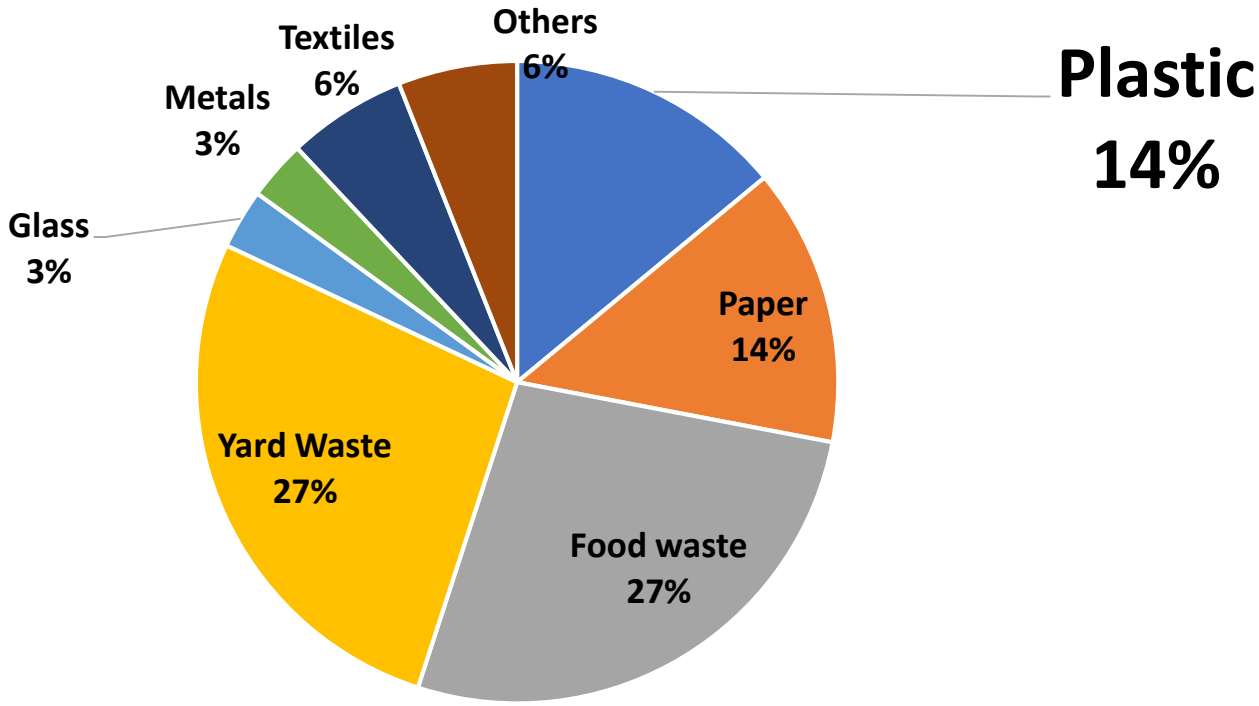
Circular Economy

- 9R Framework: a set of 9 strategies to be considered for a CE approach, in order of priority:
  - Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover.
- Waste hierarchy: A priority operations order in waste management: prevention, preparing for reuse, recycling, other recovery (including energy recovery), and disposal.
- Upcycle: Transforming waste materials, useless or unwanted products into **new materials** or **products** with high perceived value.
- Resource Efficiency: The use of limited resources in a sustainable manner and minimizing environmental impacts, delivering greater value with less input.
- **Closed Loop**: The combination of reverse and forward logistics with focus on reducing use of raw material and generation of waste by treating effluents and returning them to reuse and/or increasing the durability of products.
- Reverse Logistics: Return used or unused products (parts) from consumers to producers to generate value by reusing or proper disposing.
- Industrial Symbiosis: Cooperation among industries, where one's wastes become other inputs.
- Cradle to Cradle: Create products that allow the safe and potentially infinite (re) use of materials in cycles.
- Clean and Renewable Energies: The use of clean and renewable energy sources instead of fossil and polluting sources.
- End of Life Strategies: Sustainable strategic actions to be performed when a product of component reaches its end of life.

Household wastes under Growth Scenarios



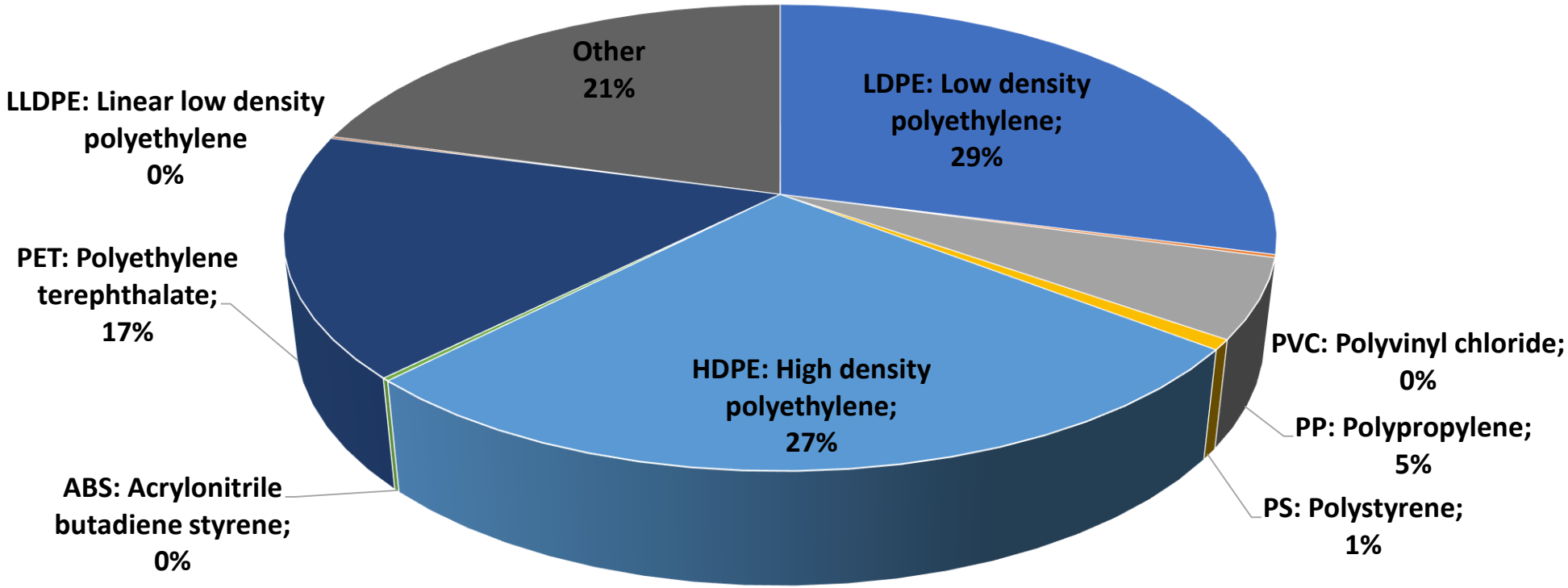
Composition of household wastes



Forecast of wastes under Growth Scenarios

Types of wastes	2019	2%		4%		6%	
		2025	2030	2025	2030	2025	2030
Plastic	**71,963**	**73,275**	**80,113**	**80,746**	**97,282**	**88,814**	**105,192**
Paper	71,963	73,275	80,113	80,746	97,282	88,814	105,192
Food waste	138,785	141,315	154,503	155,724	187,615	171,285	202,870
Yard waste	138,785	141,315	15,4503	155,724	187,615	171,285	202,870
Glass	15,421	15,702	17,167	17,303	20,846	19,032	22,541
Metals	15,421	15,702	17,167	17,303	20,846	19,032	22,541
Textiles	30,841	31,403	34,334	34,605	41,692	38,063	45,082
Others	30,841	31,403	34,334	34,605	41,692	38,063	45,082
Total	514,020	523,391	572,233	576,756	694,871	634,387	840,678

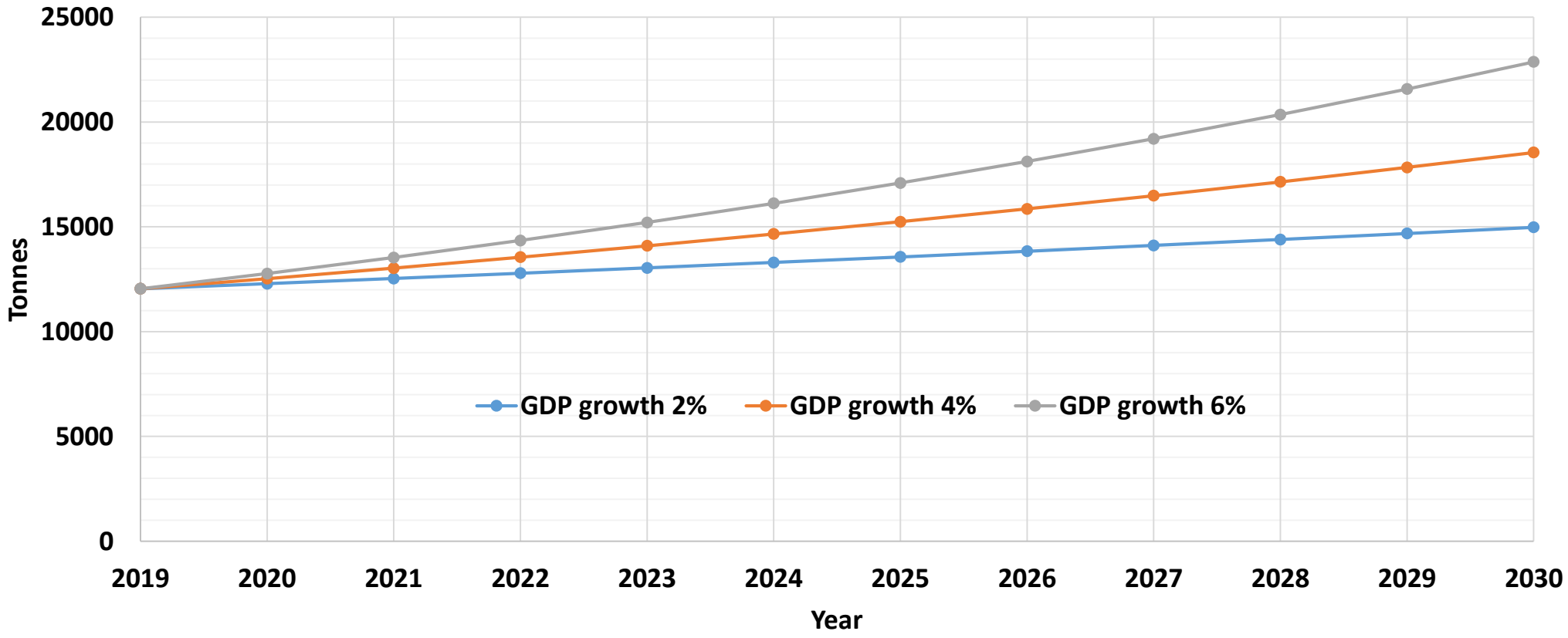
Composition of plastic wastes



Forecast of plastic wastes under Growth Scenarios

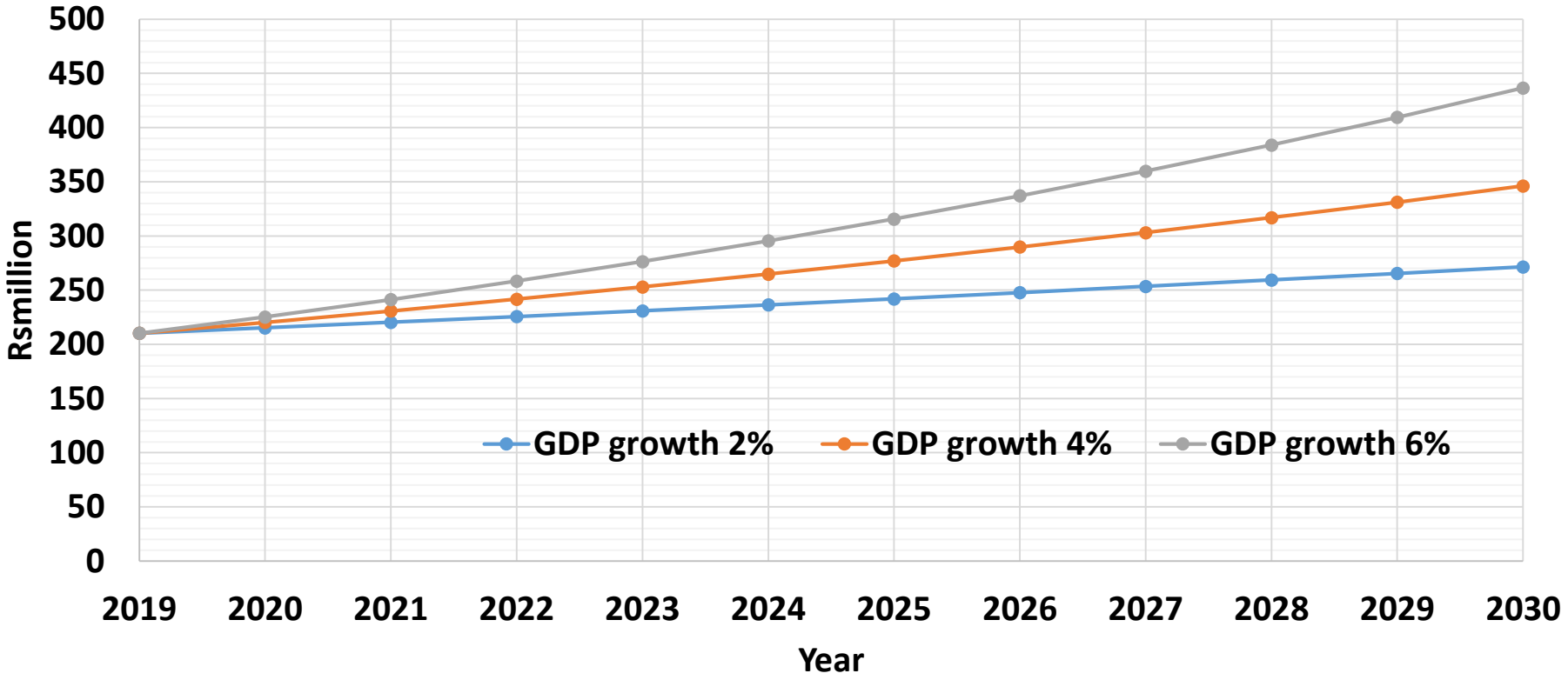
		2%		4%		6%	
Types of Plastic waste	**2019**	**2025**	**2030**	**2025**	**2030**	**2025**	**2030**
Linear low-density polyethylene	90	100	100	105	150	115	150
Polyethylene terephthalate	12000	12000	13500	13500	16300	14900	17600
Acrylonitrile butadiene styrene	150	150	160	160	200	200	210
High density polyethylene	19000	20000	21500	21600	26000	23700	28000
Polystyrene	504	513	561	600	681	600	736
Polypropylene	4000	4000	4400	4400	5300	5000	5700
Polyvinyl chloride	150	150	160	161	200	200	200
Low density polyethylene	21000	21000	23000	23500	28300	25900	30600
Total	72000	74000	80000	81000	98000	89000	106000

Quantity of PET waste projection 2021-2030 (tonnes)

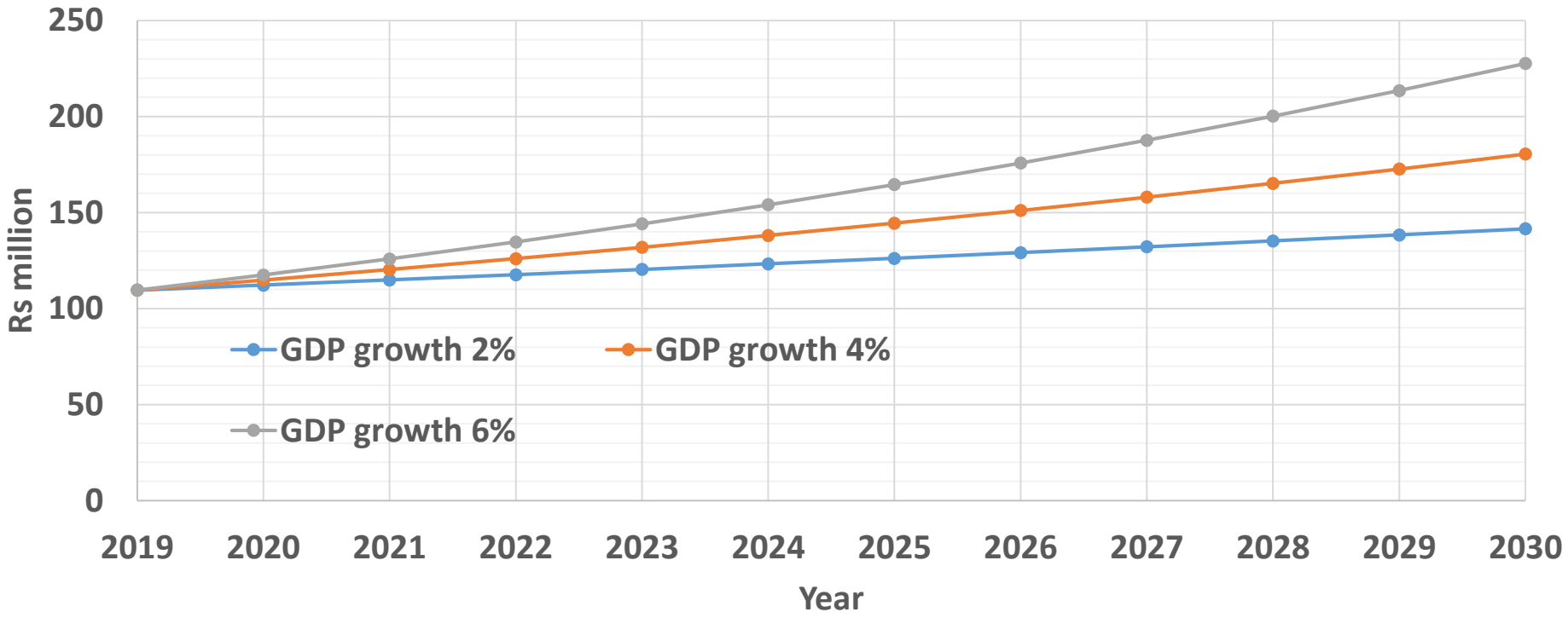


- Only around 2000-3000tonnes of PET are currently recycle in Mauritius
- It must be noted that PET are converted into secondary raw materials, not final products.
- If all the PET are converted into secondary intermediate output, the total output that can be generated will range from 368m to 480m annually, (2% to 6% growth scenarios), generating a direct formal employment of around 250 to 300.
- Indirect (formal and Informal) employment is higher

Direct gross output of recycling PET projection 2021-2030



Indirect gross output of recycling PET projection 2021-2030



The change in output of other local industries due to the purchases of intermediate inputs produce a unit of direct gross output

Recycling of PET

	Quantity (tonnes)		Total output (Rs million)		% Increase GDP	Investment (Rs Million)	
	2025	2030	2025	2030	Average 2021-2030	2025 capacity	2030 capacity
GDP growth 2%	13,567	14,979	368	413	0.04%	99.4	111.5
GDP growth 4%	15,243	18,546	422	527		113.8	142.2
GDP growth 6%	17,089	22,869	480	664		129.6	179.3

Recycling HDPE

	Total output (Rs million)		% Increase GDP	Investment (Rs Million)	
	2025	2030	Average 2021-2030	2025 capacity	2030 capacity
GDP growth 2%	532	592		144	160
GDP growth 4%	598	740	0.06%	161	200
GDP growth 6%	668	818		180	221

Employment impacts

	Direct employment		Indirect employment		Total employment	
	2025	2030	2025	2030	2025	2030
GDP growth 2%	188	211	44	50	233	261
GDP growth 4%	216	269	51	64	267	333
GDP growth 6%	246	340	58	80	304	420

	Direct employment		Indirect employment		Total employment	
	2025	2030	2025	2030	2025	2030
GDP growth 2%	272	303	64	72	337	374
GDP growth 4%	306	378	72	89	378	468
GDP growth 6%	342	419	81	99	423	517

Direct employment: The change in employment directly related to the direct gross output.

Indirect employment: The change in employment in other local industries due to the purchases of intermediate inputs to produce a unit of direct gross output.

Elements for CE-plastics

- The elements that could provide the foundations of a successful recycling system—a circular economy for plastics—are multifold:
- The first is to conduct research on product design and market conditions to reuse the recovered plastics by recycling them, turning them into new products that will create value.
  - This will require a strong industry-university collaboration.
- The second is to design or redesign plastic products to be recyclable and to be used as inputs, with the necessary certification.
- The third is putting in place effective infrastructure and logistic systems to recover end-of-life plastics.
- And the fourth is a cultural shift towards segregation and the **use** of recycling plastic by consumers and producers.