

الهيئة الملكية لمدينة الرياض
ROYAL COMMISSION FOR RIYADH CITY



Environmental Sustainability Program

14 May 2023





Riyadh Sustainability Program (Overview)



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The Riyadh Sustainability Program was launched on 23 October 2021 during the first SGI summit, and the program plan for environmental sustainability was approved on Dec 2022.

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"We aim to transform Riyadh into one of the most sustainable cities in the world."

HRH Mohammed bin Salman bin Abdulaziz, Crown Prince,

Deputy Prime Minister, and the Chairman of the Royal Commission for Riyadh City



Vision for Riyadh's Environmental Sustainability



A global steward of Environmental Preservation and a global Economic Engine driven by Resource Conservation



Position Riyadh as a responsible global leader in sustainable development that can raise the aspirations of other cities



Recognise the responsibility that the people of Riyadh bear to preserve and enhance the city's natural environment for future generations



Highlight the transformation that Riyadh will undergo as it doubles its population by 2030



Set conservation and efficiency as the main theme for Riyadh's environmental plan – based on an Arabic value of avoiding wastefulness

Riyadh Sustainability Program (Outcomes)

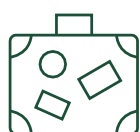


Economy



SAR 125-150 Bn

increase in Riyadh's GDP by 2030 (4-5% of total)



~300-350k

new jobs created by 2030 (~3-4% of total jobs)



Lives and liveability



15-20

positions rise in liveability ranking¹



>15k

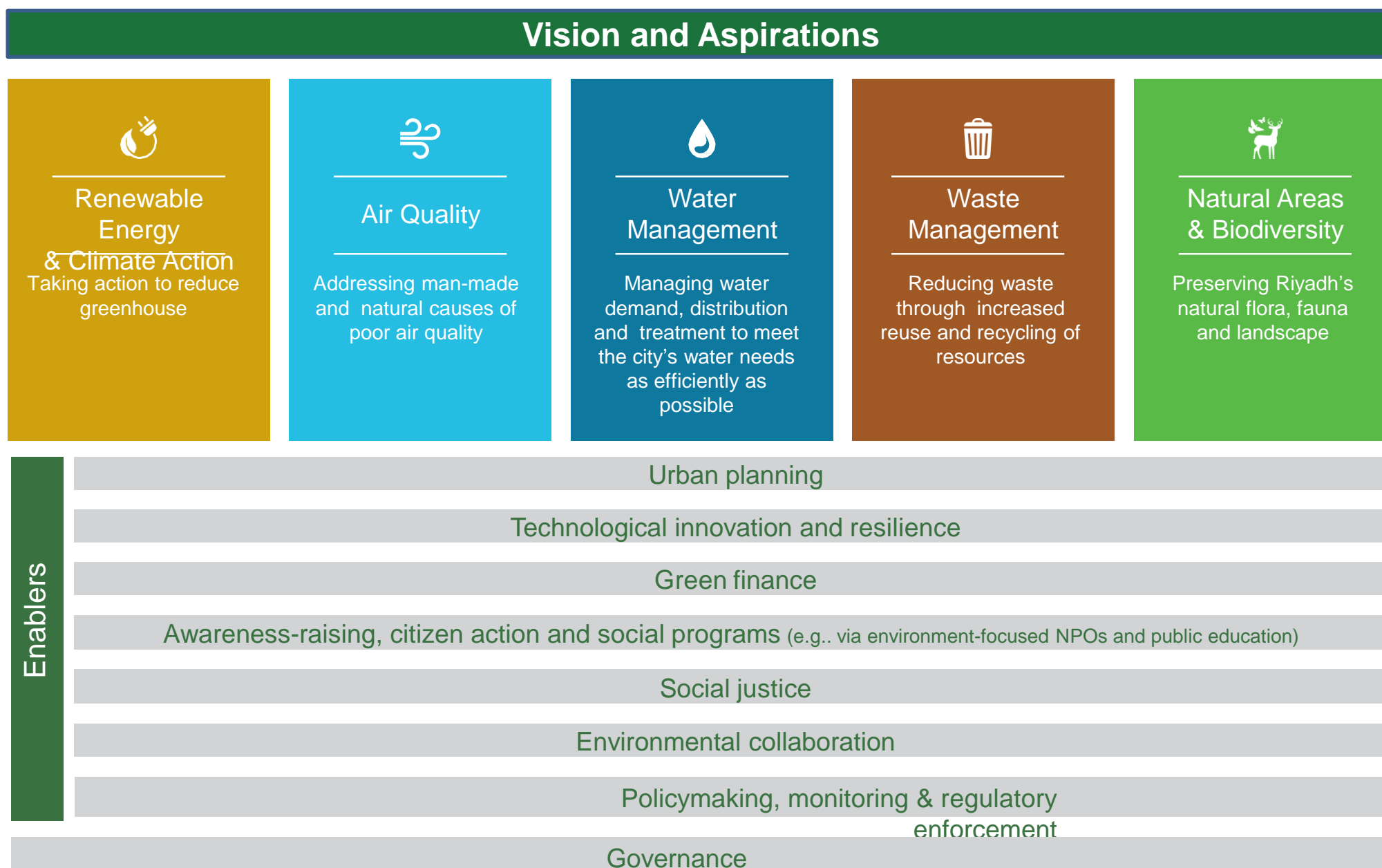
annual deaths avoided

An aspirational environmental sustainability plan could generate significant benefits for Riyadh and its citizens






1. On Arcadis Index consists People, Planet and Profit sub-indices. Current ranking of Riyadh is #76 (#82 on Planet component); aspiration is get to rank #25-30 on Planet sub-index, resulting in jump of 15-20 spaces in the overall liveability index)

Source: Proprietary GTAP GDP multiplier for KSA 2015, IQAir (PM2.5 impact), Greenpeace Southeast Asia (PM2.5 impact), OECD, Arcadis Index 2016

Riyadh Sustainability Program (Framework)



Glance at the Proposed Aspirations for Riyadh's Environmental Sustainability Strategy

 Renewable Energy & Climate Action	 Air Quality	 Water Management	 Waste Management	 Natural Areas & Biodiversity
A city that pioneers green energy	A city that prioritizes clean air	A city that does not tolerate water leakage	A city that strives to be circular	A city that wants to build its green lungs
50% share of renewables	30% reduction in NO ₂ levels to achieve compliance with WHO guidelines	Pioneer smart water piping to reduce leakage to global best practice of 8%	90% diversion of MSW waste from landfill; Elimination of illegal dumping	Planting of 15 Mn trees - largest urban greening programs globally
A city that embraces new mobility	A city that learns to adapt	A city that reuses every last drop	A city that champions sustainable construction	A city that preserves nature at its finest
30% EV adoption, 30-45% of all trips are non-car based	Adaptation as way of life: 100 smart trees throughout Riyadh to reduce particulate matter	Treat and reuse 100% of all waste water the city generates	Target the global best practice recycling rates of 80% for all construction waste	3% Green space in the urban limits and 150% reserves area VS Riyadh urban limits

Riyadh Sustainability Program (KPIs Overview)

Sustainability program includes **61** ambitious projects across five sectors, which will contribute to making Riyadh one of the best sustainable cities in the world.

Renewable Energy & Climate Action	Air Quality	Water Management	Waste Management	Natural Areas & Biodiversity
4 KPIs – 16 Projects	3 KPIs – 5 Projects	5 KPIs – 10 Projects	6 KPIs – 14 Projects	4 KPIs – 12 Projects
<ul style="list-style-type: none"> Riyadh will reduce GHG emissions as part of KSA NDC Renewables capacity share to 45%-50% in the Energy Mix Journeys made walking, cycling or taking public transport, 5% to 35% Clean Energy Vehicle of total new cars in the urban area, <1% to 30% 	<ul style="list-style-type: none"> Annual average, PM₁₀ concentration, From 218 to 120 µg/cubic meter Annual average PM_{2.5} concentration, From 64 to 40 µg/cubic meter Average annual nitrogen dioxide concentration in air, 31-21 ppb 	<ul style="list-style-type: none"> Resilient water supply, 63% to 95-100% water from desalination Water distribution losses, 36% to 8% Potable water consumption, 262 to 150 liters/person/day Sewage network coverage, 63% to 95-100% Wastewater recycling, 22% to 90-100% 	<ul style="list-style-type: none"> MSW sorting at source, to 90% MSW landfill diversion rate, 9% to 83% of total MSW produced MSW production, 1.5 to 1.2 kg/person/day MSW organic waste, 0.84 to 0.42 kg/person/day C&D recovery rate, 0% to 80% C&I illegal dumping to 0% of C&I not properly treated 	<ul style="list-style-type: none"> Area of natural reserves compared with urban developed area, to 150% Green space share of urban area, 1.5% to 9% Green space per capita in urban area, 1.7 to 28 m²/person % of species of flora and fauna (plants and animals) lost in Riyadh to 0%












Key KPIs



1. Renewable Energy & Climate Action – targets and KPIs

Objective

Achieve net zero GHG emissions by 2060













KPI	Riyadh		Benchmarks (current - target 2030)
	Current	2030 target	
1 Riyadh will reduce emissions as part of KSA NDC			 Los Angeles: 65% (by 2035)  Barcelona: 50%  Paris: 50%
2 % Renewables capacity share in the energy mix	<1%	50%	 New York: 100% (by 2040)  Paris: 45%  Sydney: 100%
3 % Journeys with environmentally friendly means (e.g public transport, walking, cycling)	5%	35%	 London: 64% - 80%
4 % Clean Energy Vehicle of total new cars	N.A.	30%	 London: 9% - 100%  Paris: 11% - 100%

Source: Riyadh City Strategy, Urban Observatory, city environmental sustainability plans

2. Air Quality – targets and KPIs

Objective

Drive holistic improvement of air quality while experiencing one of the fastest growths of a city

KPI	Riyadh		Benchmarks (current - target 2030)
	Current	2030 target	
5 Annual average PM ₁₀ concentration in air, µg/cubic meter	218	120 (45%)	 WHO ¹ : 20  Abu Dhabi ² : 134  Los Angeles ³ : 29  Phoenix: 59
6 Annual average PM _{2.5} concentration in air, µg/cubic meter	64	40 (37%)	 WHO: 10  Abu Dhabi: 44  Los Angeles: 13  Phoenix: 11
7 Average annual nitrogen dioxide concentration in air, ppb ⁴	31	21 (32%)	 WHO: 21  Abu Dhabi: 16  Los Angeles: 12  Phoenix: 13








1. Guideline values; 2. Investigations on PM₁₀, PM_{2.5}, and Their Ratio over the Emirate of Abu Dhabi, United Arab Emirates; 3. Air quality is impacted by sea winds; 4. Using conversion rate 1 µg/m³ NO₂ = 5.32 × 10⁻¹ ppm

Source: Riyadh City Strategy, Urban Observatory, city environmental sustainability plans

3. Water Management – targets and KPIs

Objective

Become the globally leading water sensitive city by reducing consumption and reusing 100% of the city's wastewater by 2030

KPI	Riyadh		Benchmarks (current - target)
	Current	2030 target	
8 Resilient water supply , % water from desalination	63	95-100	 Singapore: 30 - 30
9 Water distribution losses , %	36 ¹	8 ²	 Singapore: 8 - 5  Los Angeles: 10 (current)
10 Potable water consumption , litres/person/ day	262	150 ³	 Singapore: 141 - 130  Phoenix: 408 - 285
11 Sewage network coverage , %	63	95-100	All top cities are at 100%
12 Wastewater recycling , %	22	100 ⁴	 Singapore: 100 (current)  Los Angeles: 27 - 100

1. Includes both potable water and sewage networks leaks;

2 Riyadh target in line with target set in [MEWA National Water Strategy]; 3. Riyadh target in line with target set in [Riyadh City Strategy, 2021]; 4. Driven by










Green Riyadh initiative

Source: Riyadh City Strategy, Urban Observatory, city environmental sustainability plans

4. Waste Management – targets and KPIs

Objective

Develop a best practice waste management system across all categories with the goal of becoming the regional hub for the C&D³ recycling industry and achieving near-zero MSW⁴ waste to landfill by 2030

KPI	Riyadh		Benchmarks (current - target)
	Current	2030 target	
13 C&D recovery rate ¹ , %	0	80	 London: 80 - 95
14 MSW production, kg/person/day	1.5	1.2	 Barcelona: 1.3 - 1.2  Singapore: 0.8 - 0.7  Los Angeles: 8.1 - 6.8
15 MSW organic waste, %	0.84	0.42 (50%)	 London: 0.38 - 25  Los Angeles: 0.49 (current)
16 MSW sorting at source, %	~0	90	All top cities are at >90%
17 MSW landfill diversion rate, % of total MSW produced	9	83 ²	 London: 88 - ~100  New York: 18 - 90  Stockholm: ~100 (current)
18 C&I illegal dumping, % of C&I not properly treated	N/A	~0	All top cities are at >95%










Source: Riyadh City Strategy, Urban Observatory, city environmental sustainability plans, European Commission, towardszerowaste.gov.sg,

1. Includes recycling and reuse | 2. ultimate goal 94% by 2035. | 3. C&D: Construction and Demolition | 4. MSW: Municipal solid waste

5. Natural Areas & Biodiversity – targets and KPIs

Objective

Preserve and augment the terrestrial ecosystem and biodiversity of Riyadh while progressing the development and expansion of the city

KPI	Riyadh		Benchmarks (current - target)
	Current	2030 target	
19 Area of natural reserves compared with urban developed area, %	56%	150%	 Melbourne: 11 ¹  London: 19  Singapore: 5
20 Green space share within urban area, %	1.5%	9%	 Melbourne: 19  London: 18 -21  Singapore: 41
21 Green space per capita in urban area, m ² /person	1.7	28 ³	 Melbourne: 116  London: 78  Singapore: 60
22 # of species of flora & fauna (plants & animals) lost in Riyadh	N.A.	0	N.A.

1. Figure for state of Victoria; 2. 60% ratio based on 5,852 sq km natural protected area out of 9,079 sq km area of Riyadh and surrounding areas;

3. Number dependent on New Riyadh City strategy implications of pollution growth to 15 to 18m by 2030

Source: Riyadh City Strategy, Urban Observatory, city environmental sustainability plans



Potential opportunities (discussion)





Appendix



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