

Building a Sustainable Airport CPK Transport Hub

IATA WPS Chicago 2023

Antoinette Nassopoulos Erickson
Senior Partner



Foster + Partners

Foster and Partners 40 years of Airport Terminal Design

1980



Stansted Airport
UK 1981-1991

1990



HACTL Superterminal
Chek Lap Kok
Hong Kong 1992-1998



Hong Kong International Airport
Chek Lap Kok 1992-1998

2000



Frankfurt T3 Masterplan
Frankfurt, Germany 2004



Thames Hub
London, UK 2001
(Concept)

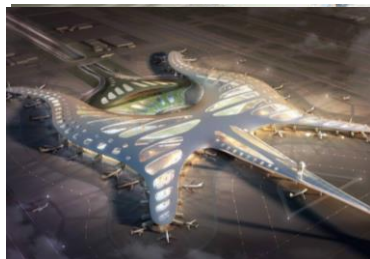


Heathrow Masterplan
London, UK 2004 (-2005)



Heathrow Virgin Atlantic Upper Class terminal
London, UK 2004 (-2005)

2010



Incheon Airport T2 Masterplan,
Korea 2006-2009



LEED Gold

Spaceport America New Mexico,
USA 2006-2011



Beijing International Airport
Beijing, China 2003-2008



BREAM Excellent

Heathrow Terminal 2
London, UK 2006



LEED Gold

Queen Alia International Airport
Amman, Jordan 2006-2013



LEED Gold

Kuwait International Airport
Kuwait City, Kuwait 2010 (On site)

2015



Tocumen International Airport
Panama City,
Panama 2011 -2019



LEED Platinum

Mexico International Airport
Mexico City 2014



John F Kennedy International Airport Vision Plan 2050
New York, USA 2016



HQetm

Marseille International Airport
France 2016 -



LEED Platinum

Phnom Penh International Airport
Phnom Penh, Cambodia 2018 -



LEED Gold

Red Sea International Airport
Saudi Arabia 2020 -



LEED Gold

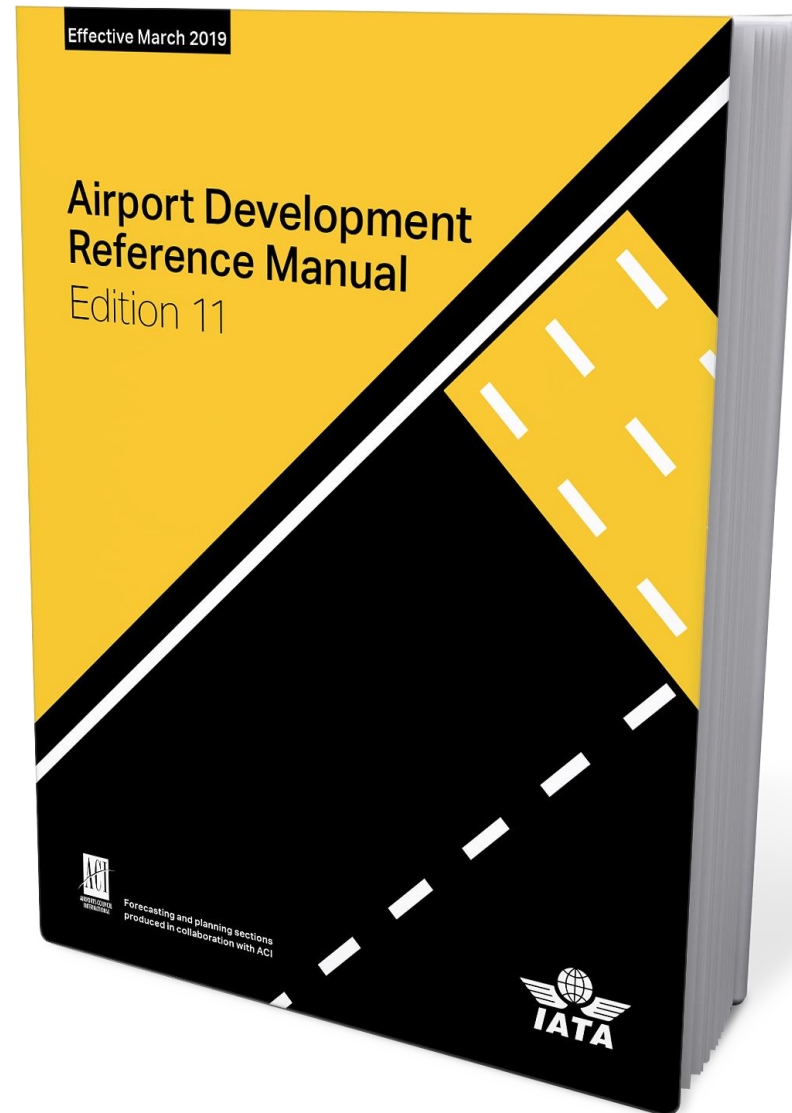
AMAALA Airport
Saudi Arabia 2020 -

2005

2020

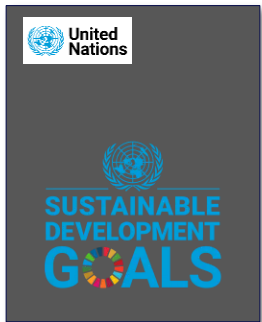
IATA ADRM 12th Edition

Sustainability Chapter

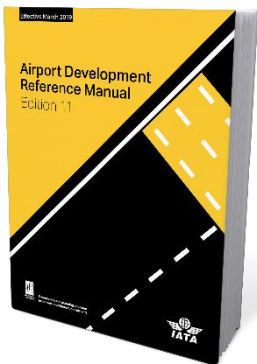


IATA ADRM 12th Edition Sustainability Chapter

Foster Responsibility Framework themes (2014)



ADRM – IATA – 12th edition – Sustainability chapter























IATA ADRM 12th Edition Sustainability Chapter

Chapter
Coordinator

Chapter
Owner

Chapter
Contributor

Goals/Sections

Foster + Partners							
		Foster + Partners		Foster + Partners	ARUP	IDOM	 <small>a company of Royal HaskoningDHV</small>  <small>AIRPORTS COUNCIL INTERNATIONAL</small>
	 	 <small>a company of Royal HaskoningDHV</small>	   	 <small>a company of Royal HaskoningDHV</small>	   <small>a company of Royal HaskoningDHV</small>	  	ARUP 
Introduction	Environment and Health	Community and Social	Energy and Carbon	Green Mobility	Resources Management	Resiliency	Performance Management
Context	Local Air Quality	Local municipality and communities	Embodied Carbon	Sustainable Transport	Water	Business Continuity	Measuring, monitoring and reporting
Purpose							
Topics introduction	Noise	Sustainable land utilization Planning for future need and benefits	Operational Carbon - Design	Traffic Management	Materials	Operational Resiliency	Targets and benchmarks
	Water and Soil	Social and Economic impacts	Operational Carbon - Use	Zero Emissions Vehicles	Waste	Climate Resiliency	Digital technology
	Indoor / Outdoor Environmental Quality	Transport links	Refrigerant Management	Future Proofing Mobility	Land Use	Future Innovations and Trends	
			Renewables				

Centralny Port Komunikacyjny is a transfer hub planned in Poland between Warsaw and Łódź, to integrate **air, rail and road transport**, and includes:



Airport

a modern greenfield airport planned in the heart of Poland and Central and Eastern Europe



Railway

a network of almost 2,000 km of railway lines, including high-speed lines



Airport City

the development of business, office, hotel, residential and leisure infrastructure

Centralny Port Komunikacyjny Iconic single facility

CPK
in numbers

2028

40 Million passengers (capacity)

2 Runways

330 000 Air Traffic Movements (capacity)

1,1 M Tonnes Cargo volume (capacity)

2060

65+ Million passengers (capacity)

3 Runways

450 000 Air Traffic Movements (capacity)

1,8 M Tonnes Cargo volume (capacity)

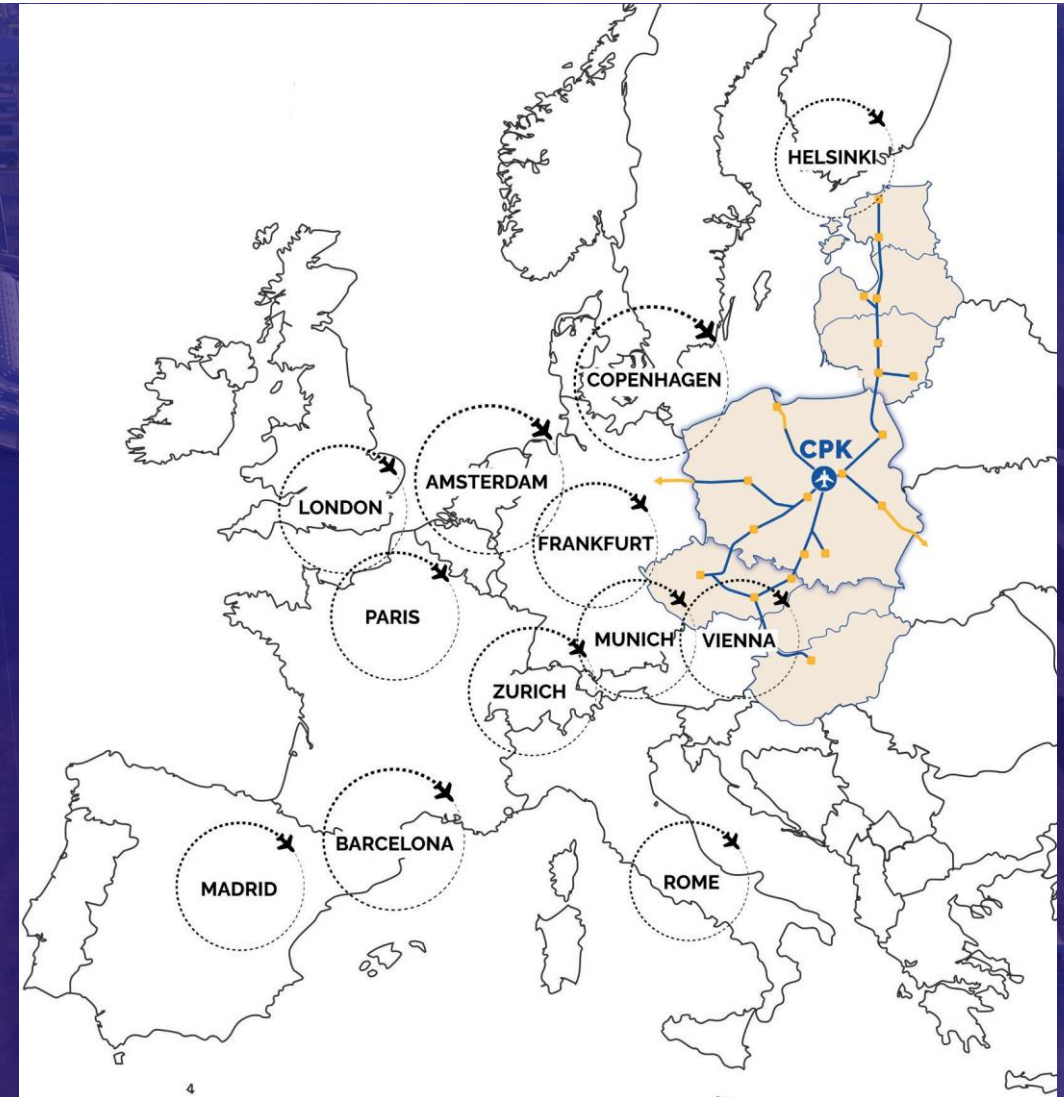
CENTRAL AND EASTERN EUROPE MARKET

CPK as the gateway to CEE and the main hub transport centre for the region

Together with Poland's rail network, Rail Baltica and V4 HSR, providing future-fit connectivity to the region

CPK essentially complements the TEN-T network, as the multimodal heart of an integrated system

In line with six objectives of the EU Taxonomy, supported by green transport policy



Centralny Port Komunikacyjny Integrated Transport Hub



Centralny Port Komunikacyjny Passenger first approach





Centralny Port Komunikacyjny

A seamless journey through an integrated transportation



Net Zero emissions from 2028

Significant share of zero-emission fleets, electric power and air-conditioning supply

Sustainable building construction Multimodal system of airport with the rail and road network vastly enhancing the short-time catchment area

Green transport

Reduction of domestic flights supported by convenient green transport connections

Airport Carbon Accreditation

>14-fold reduction in the number of people affected by aircraft noise compared to WAW airport

Buildings and infrastructure

to be certified at the high sustainability level according to the best world's standards



SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS



CPK's Sustainable Development Strategy



EU level + Country level Green Policies

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION 
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION 
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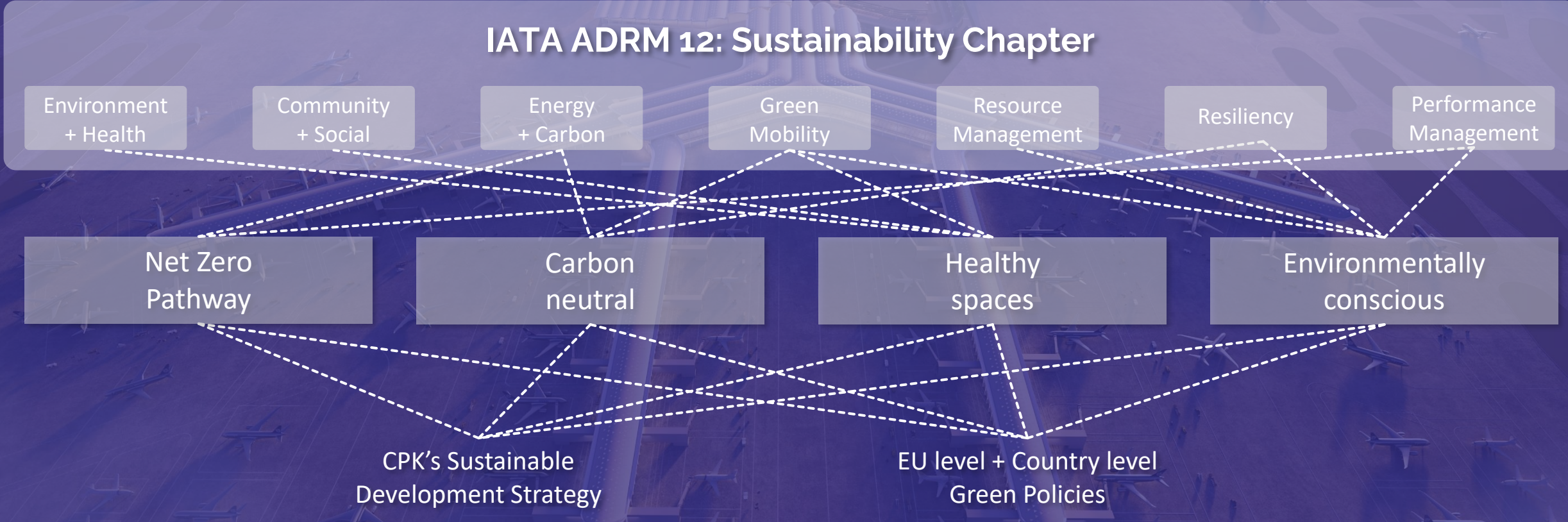


CPK's Sustainable Development Strategy



EU level + Country level Green Policies

IATA ADRM 12: Sustainability Chapter



Transition from fossil fuels towards all-electric from zero-emission electricity supplies

Increase energy efficiency + manage energy demands

Track and reduce Scope 1, 2, 3 GHG emissions

Implement a whole life carbon approach

Support innovation + SAFs

Utilise performance metrics to monitor + deliver continuous improvement

Resilient design meeting future challenges



**Adoption of Whole Life Carbon
Design Approach**

Masterplan scale strategies

Expandable District Scale Systems

5th Generation Energy Network

Net-Zero ready buildings – Day-1

On-site renewable generation technologies

Targets built into airport city guidelines

Plan incentives for SAF aircraft

Multimodal hub

High performance buildings



Whole life carbon



Resilient design



Optimisation of envelope



Indoor environmental quality



Enhancing user experience





Setting Building Specific KPIs
PTB EUI: <4 kWh/pax



Ambient Loop Energy Supply

All-electric: Geothermal + ASHP Energy supply

Renewable Energy: PV Array providing electrical supply

High performance envelope targets

Optimised façade + roof balancing daylight distribution + heat losses

No on-site combustion and PPA agreements

Net Zero ready equipment selection

Electrical provision for remote and fixed stands

Smart Building Strategy – optimising operations

Centralny Port Komunikacyjny Decarbonisation Approach: Up Front Embodied Carbon



Upfront embodied carbon calculations – informing design

Adaptable + flexible structures

Modularisation
+ pre-fabrication

Lean design principles:
material efficiency

Use of natural materials

Implement clean construction –
monitor onsite activities

Early procurement / supply
chain WLC development

Circular Economy approach –
designed for disassembly

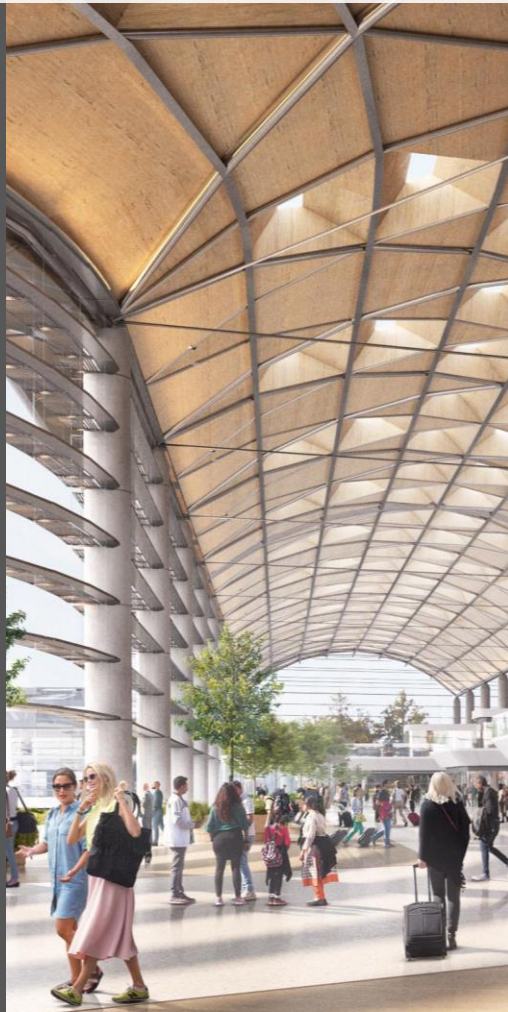
Centralny Port Komunikacyjny
CPK Sustainability Strategy / Health + Wellbeing



Wayfinding driven design for passengers



Site-wide water-conscious approach



Inclusive design at all scales and for all



Healthy and restorative airport experience



Biophilic design principles from arrival

Centralny Port Komunikacyjny CPK Sustainability Strategy / Health + Wellbeing

High-performance envelope for energy and daylight balance
Glare control $<10\%$ ($ASE_{1000,250}$)
Average Daylight Illuminance ~ 300 lux*

Views out and smooth wayfinding promote connection with outdoors, inclusivity and wellbeing

Biophilic interior design through shapes, material selection and greenery

Minimise VOCs concentration $<300 \mu\text{g}/\text{m}^3$

Optimal acoustic performance <55 dbA

Views out

Enhanced fresh air ventilation rate 14 L/s/pax

Displacement ventilation to reduce draught risk close to facades

Highly efficient air filtration systems $<16 \mu\text{g}/\text{m}^3 \text{ PM}_{2.5}$

Thank you

www.cpk.pl

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