



INTERNATIONAL INNOVATION

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12:45:	Introductions
12:55:	Presentation
13:45:	Discussion
14:00:	Presentation/summary
14:15:	Finish/questions



CREDENTIALS

BA (HONS) INDUSTRIAL DESIGN

MBA 2007

DBA 2019

ITT

DESIGN CONSULTANCY

ADDIS HOUSEWARES DESIGN MANAGER

MITSUBISHI DESIGN MANAGER

CARDIFF SCHOOL OF ART AND DESIGN

VCU QATAR/QATAR BUSINESS INCUBATOR CENTRE

HERIOT WATT UNIVERSITY

UNIVERSITY OF BIRMINGHAM



UNIVERSITY OF BIRMINGHAM

Founding Russel Group member, top 100 worldwide

Established in Dubai in **2017**

MoE Licensure: **2019**

New campus opened: **January 2022**

c.**1400** students and c.**140** staff

5 colleges, 26 schools, 110 research centres

600 master's programme

3,500 students



UNIVERSITY OF
BIRMINGHAM
DUBAI

UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

LICENSED
UNIVERSITY

MY ADVICE

Go to art college for month

Do the Myers Briggs Test

Do the Meredith Belbin Team Role Inventory test

Don't look for a job. Create a job



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BIRMINGHAM
DUBAI

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THE UAE: PERCEPTION VS REALITY

UAE - SMALL AMBITIOUS NATION – LIKES TO BE #1

STRATEGY 2071 - STABILITY

INNOVATION STRATEGY

WORLD EXPO LAST YEAR

HYPERLOOP – REALLY? – WHAT DO YOU THINK??

BIG ON SUSTAINABILITY, WELL.....

COP 28 NOVEMBER

UAE & REGIONAL CONTEXT

7 EMIRATES (MULTIPLE BEDUIN
FAMILIES)

KHALIFA'S AND MAKTOUM'S
EMERGED

INDEPENDENT EMIRATI GOVERNANCE

FEDERAL GOVERNMENT



THE UAE: CONTEXT

YOU'VE ONLY HEARD OF TWO!

POPULATION: 9.9M

85% EXPATRIAT

INDEPENDENCE FROM UK IN 1971

DUBAI INCOME: TOURISM



THE UAE: CONTEXT

TRANSIENT, VULNERABLE POPULATION

NO VISA – NO JOB.....

.....NO HOUSE, CAR, PHONE UTILITIES.....

SINGLE EXPATS/FEWER FAMILIES

NEW VISAS – 10 YEARS – GOLDEN VISA





THE RENTIER STATE

ABU DHABI INCOME FROM O&G

CONTENT NATIONAL POPULATION

BENEFITS FOR NATIONALS

ZERO PERSONAL TAX

5% VAT

EMIRATI SUBSIDIES

GENEROUS PUBLIC SECTOR PACKAGES





UAE LEADERS

H.H. Sheikh Zayed bin Sultan Al Nahyan, Founding
Father of the UAE



UAE LEADERS

H.H. Sheikh Khalifa Bin Zayed Al Nahyan President of the United Arab Emirates, Abu Dhabi

Passed away in May 2022 now led by his brother, Sheikh Mohamed bin Zayed Al Nahyan



UAE LEADERS



Sheikh Mohammed bin Rashid Al Maktoum, Ruler of Dubai and Vice-President of the United Arab Emirates (Dubai)





AUTOCRACIES

Freedom of speech?

Community engagement?

Consistency

Stability – told what to do

Long term vision





BUBBLE

DUBAI: WHAT WAS ONCE DESERT IS
NOW A SMART CITY WITH SHINY
BUILDINGS

(WITH FLAWS!)

IN JUST 2 GENERATIONS



An aerial view of the Ferrari World roller coaster car, which is red with a yellow Ferrari shield logo and a blue circular opening at the front. The car is positioned on a track that curves around a checkered pattern. In the background, there are various buildings and structures, including a large blue dome-shaped building.

PERCEPTION VS REALITY

BIGGEST AND THE BEST

FERRARI WORLD AT YAS ISLAND



PERCEPTION VS REALITY

\$1bn GRAND MOSQUE





PERCEPTION VS REALITY

\$1.2Bn BURJ KHALIFA (Burj Dubai!)





PERCEPTION VS REALITY

\$1.5Bn ATLANTIS HOTEL





PERCEPTION VS REALITY

\$1Bn BURJ AL ARAB HOTEL





PERCEPTION VS REALITY

\$12Bn PALM, DUBAI



PERCEPTION VS REALITY

\$13Bn 'THE WORLD', DUBAI

DOESN'T STOP IT SINKING!!

Increased tourism revenues will see them kick-starting this and other ambitious projects!





THE BLACK STUFF

Drop in oil prices from \$140 to less than \$40 last year caused havoc across the oil-rich Gulf states but recent rise to circa \$95 is good for the UAE (not the rest of the world!)

UAE Needs WTI oil to be **\$60+** to balance its budget

The UAE economy is highly sensitive to fluctuations in oil price





DUBAI BANKRUPT IN 2008

Originally named Burj Dubai

2008 - Renamed in honour of the ruler of Abu Dhabi after lending Dubai \$250bn to pay its debts.





QATAR EMBARGO

Political tensions (Iran)

Qatar's alleged support of Muslim Brotherhood, al-Qaeda or Islamic State (IS)

World Cup 2022 – world stage



CULTURE

The problem with the rentier state

Privileged

Academic under achievers (men in particular)

Expect public sector employment

High salaries

Early retirement

Unsustainable





CULTURE

Hypocrisy

Corruption and money laundering (real estate especially)

Hidden taxes (School fees, F&B in particular)

Motoring fines, alcohol, imported food

Need for private healthcare cover

Poor quality – race to the bottom mentality



INNOVATION IN THE UAE

UAE government encourages disruptive innovation





NATIONAL INNOVATION STRATEGY

3 KEY PILLARS:

1. AN INNOVATION- ENABLING ENVIRONMENT

Regulatory framework, providing comprehensive enabling services, enhancing the technology infrastructure and ensuring the availability of investments and incentives.

2. INNOVATION CHAMPIONS

AT MINISTERIAL LEVEL

3. PRIORITY SECTORS

RENEWABLE ENERGY
TRANSPORT
EDUCATION
HEALTH
TECHNOLOGY
WATER
SPACE

Add the word 'sustainability' where appropriate!



DRIVERS OF INNOVATION

NECESSITY

DISRUPTIVE TECHNOLOGIES

GLOBAL RECESSIONS (2008)

PANDEMICS

EXPO's, COP28





NATIONAL VISION 2030

A diversified and flexible knowledge-based economy will be powered by skilled Emiratis and strengthened by world-class talent to ensure long-term prosperity for the UAE

HARNESS FULL POTENTIAL OF HUMAN CAPITAL.....
maximising the participation of Emirati's, encouraging ***entrepreneurship***, and nurturing home-grown public and private sector ***leaders*** while attracting and retaining the best talent





NATIONAL STRATEGY FOR YOUTH

The Agenda outlines 5 key objectives to achieve the transition:

1. **Inquisitive** youth who are educated for life
2. **Entrepreneurial** youth who realise their full potential
3. Healthy and safe youth who are protected from harm
4. **Responsible** and stable youth who plan for their future
5. Patriotic and **value-driven** youth who embody the UAE's identity and culture

Source: <https://agenda.youth.gov.ae/#agenda-development>



NATIONAL STRATEGY FOR YOUTH

VISION

A generation of productive young people with an entrepreneurial and pioneering spirit who embody Emirati values

FUTURE TALENT

*‘Prepare a national talent pool and **entrepreneurs** for 4IR and equip them with the required knowledge and skills in **advanced science and technology** through an applied educational system focused on **innovation** and **entrepreneurship** in **high priority sectors**’.*





PARTNERSHIP FOR THE FUTURE

UAE-UK Agreement (September 2021), including an initial investment from **Mubadala of £800m** and a **£10bn over the next five years** – the Partnership's remaining three investment priorities: **energy transition, technology and infrastructure.**

AIM: To strengthen collaboration in **life sciences, energy innovation, regional issues, illicit finance, education, security, development, culture, climate, and health and food security**

9 priority areas: Life Sciences, hydrogen, space, renewable energy, smart and green sustainable manufacturing



2071

CELEBRATING A CENTENARY

50-year challenge

Call to all citizens and residents of the UAE

Develop innovative and practical solutions in four areas:

Zero accidents

Zero carbon emission

Zero obesity

Zero plastic





THE INNOVATION STATE

THE UAE HAS CONSTANTLY BEEN DISTINGUISHED AS AN ICON FOR INNOVATION AND CREATIVITY, ENHANCING ITS SOCIAL AND ECONOMIC STATUS.

IT IS IN THE LEADERSHIP'S DNA





WHY INNOVATE?

Drivers include:

Improving quality of life

Increasing economic growth through
diversification

Enhancing knowledge economy

Improving global competitiveness

Creating high skilled jobs

Promote entrepreneurship

But what makes the UAE any different?





PUBLIC SECTOR INNOVATION

MBR Centre for Government Innovation

3 pillars: Innovative Ideas, Innovative Capabilities, and Innovative Culture.

AIM: To support the development of innovative services and find solutions to challenges.

Training and upskilling nationals Most leave education with just a high school qualification)

Building a global network of partnerships (private and academic).

FUNDING INNOVATION

No UKRI

No ESPRC

GOVERNMENT DISTRIBUTES FUNDS

GOVERNMENT DEPTS.

NATIONAL UNIVERSITIES



RISK APPETITE

MOU'S

NDA'S

Legal challenge? I don't think so!





GLOBAL INNOVATION INDEX

KPI's include:

Political, regulatory and business environments
Quality of education
Infrastructure (ICT, logistics)
Access to finance (credit and investment)

2017: Ranked 35th

2019: Ranked 36th (despite its ambition and initiatives!!).





SMART CITIES

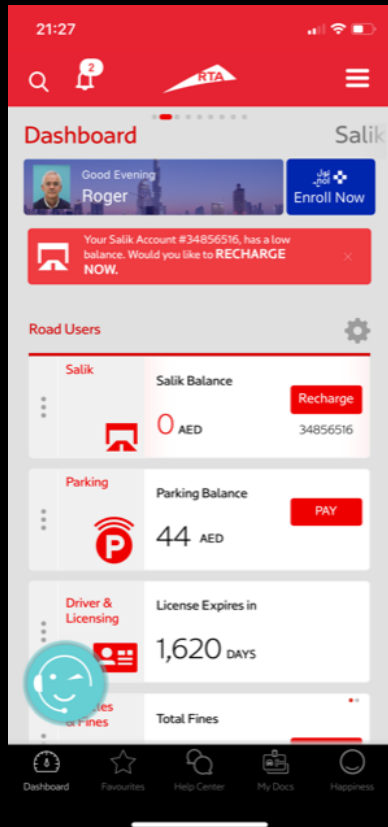
SMART DUBAI

A connected city

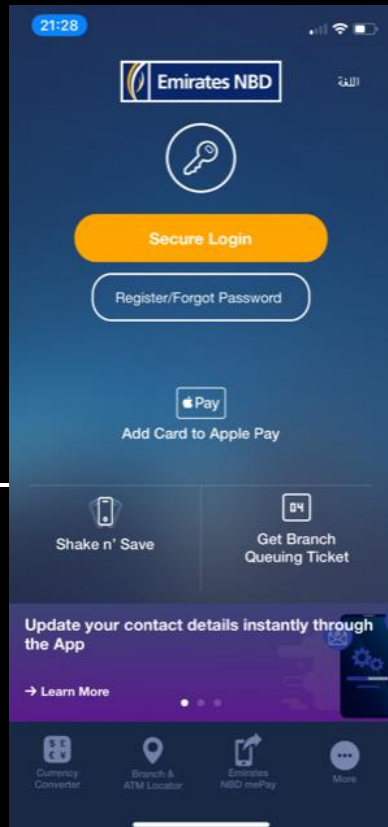
Apps for...everything!



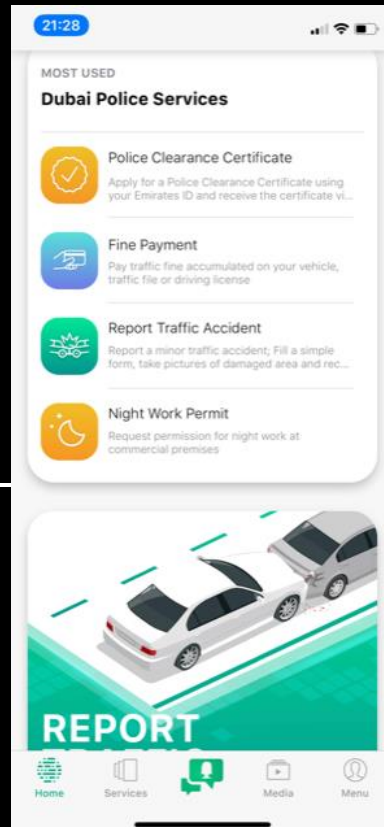
THE 'APP' CITY



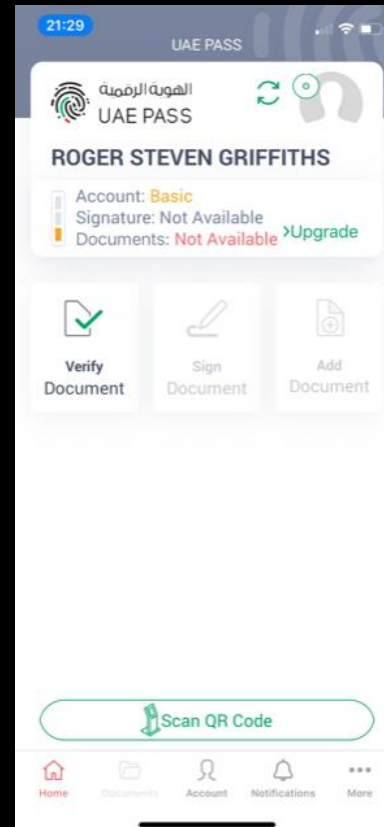
CAR PARKING



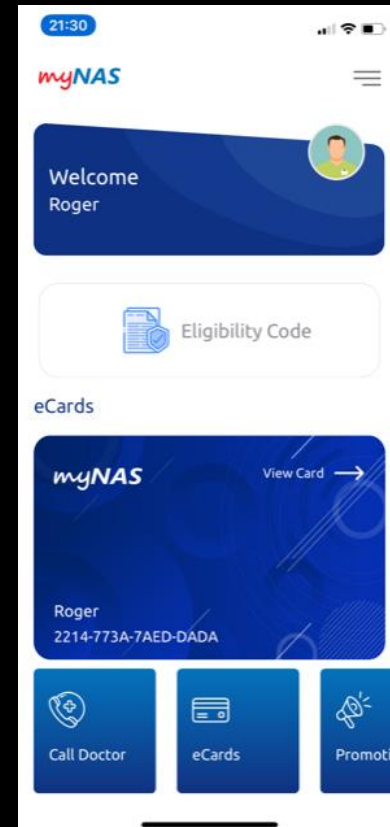
BANKING



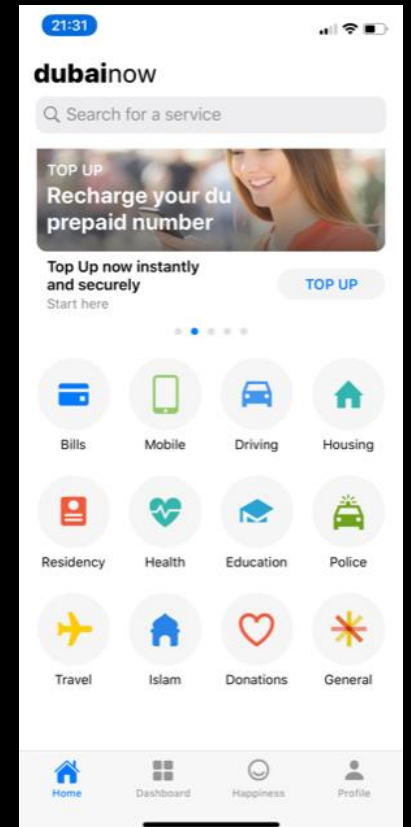
POLICE



VISA



HEALTHCARE



RESIDENCY

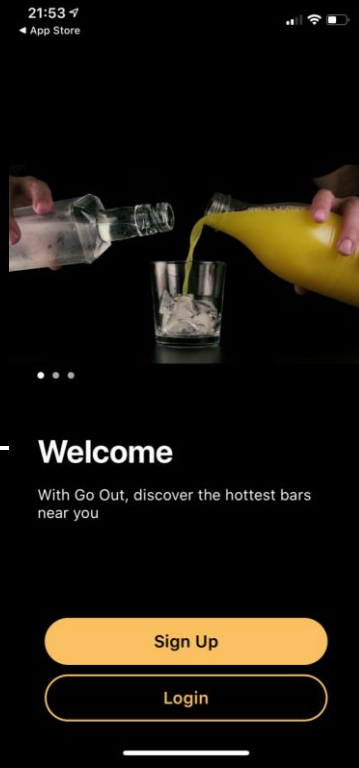
THE 'APP' CITY



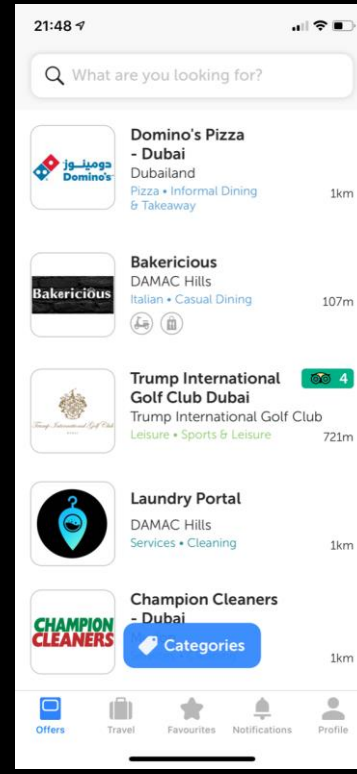
SHOPPING



PETROL



SOCIALISING



FAST FOOD

HAPPINESS CENTRES

Effort to improve online customer services



Minister of State for Happiness and Wellbeing



Survey after every interaction with government services

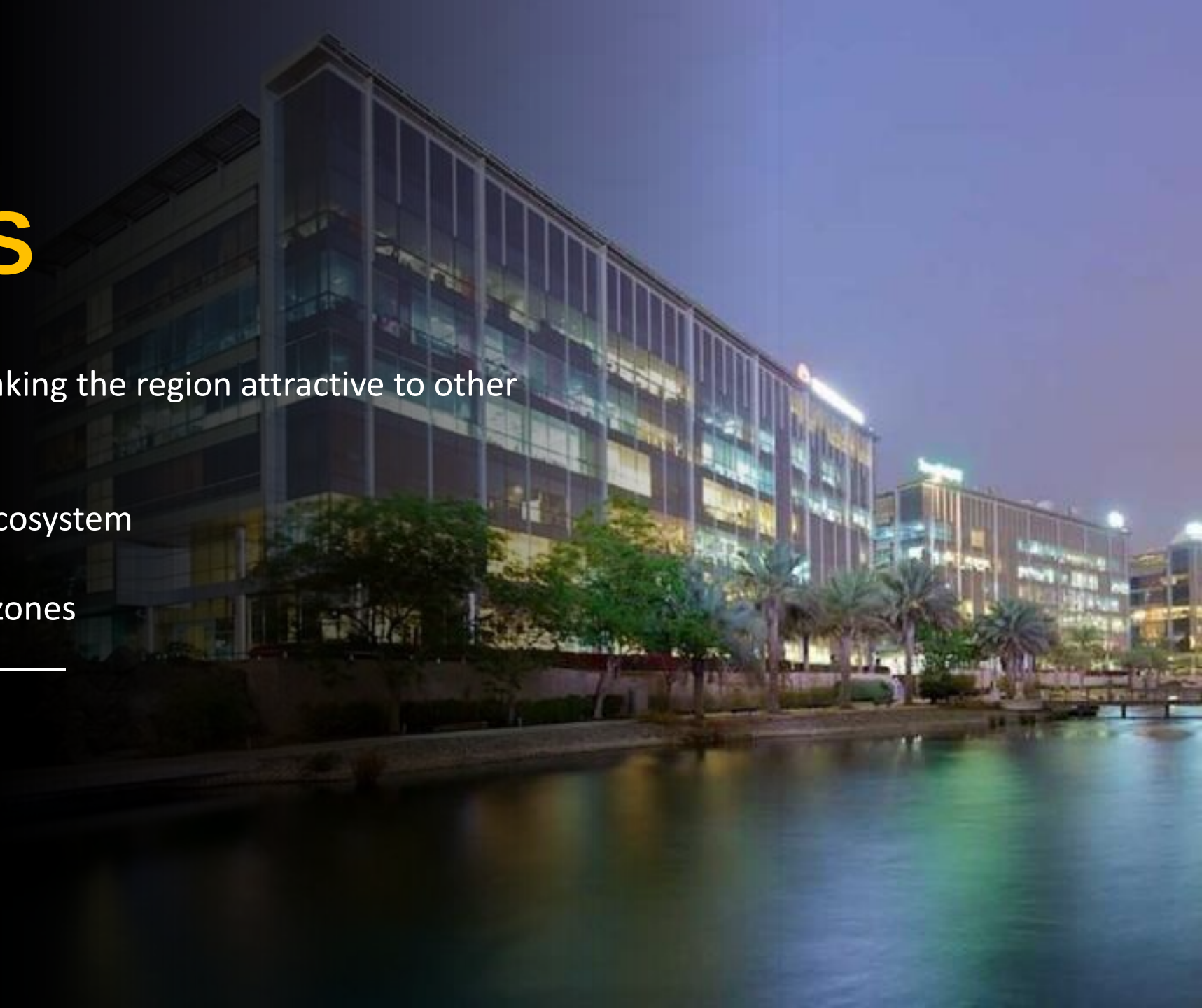


FREEZONES

AIM: diversify the economy by making the region attractive to other industries

Create an attractive investment ecosystem

Sector specific, collaborative freezones





FREEZONES

50+ freezones across the UAE

Simplified startup processes



- Dubai Academic City
- Dubai Airport Freezone
- Dubai Biotechnology & Research Park
- Dubai Car and Automotive City Free Zone
- Dubai Design District
- Dubai Gold and Diamond Park
- Dubai Healthcare City
- Dubai Industrial City (DIC)
- Dubai International Academic City
- Dubai International Financial Centre
- Dubai Internet City (DIC)
- Dubai Knowledge Village
- Dubai Logistics City
- Dubai Media City
- Dubai Multi Commodities Centre
- Dubai Outsource Zone
- Dubai Silicon Oasis
- Dubai Studio City
- Dubai Techno Park
- Dubai Technology and Media Free Zone
- International Media Production Zone
- Jebel Ali Free Zone
- Economic Zones World
- Dubai South
- Dubai Science Park
- TECOM
- Masdar City



FREEZONES

100% FOREIGN OWNERSHIP (No Local Partner*)

Corporation Tax Exemption

0% Import/Export Taxes

100% Repatriation Of Capital And Profits

No Personal Income Taxes

Also Applies To Universities

WHAT'S IN IT FOR DUBAI?

License fees range from AED10,000 – 100,000
(hidden taxes!)

Diversified economy (tourism, F&B, retail)

Resident spending in local economy

Sector leadership

Global hub

*Outside of free zones, non-UAE residents must therefore set up with a local partner who takes minimum ownership of 51%.

INNOVATION ECOSYSTEM

Government department competition

KPI's

Duplication of effort/resources





TWO FOUR 54

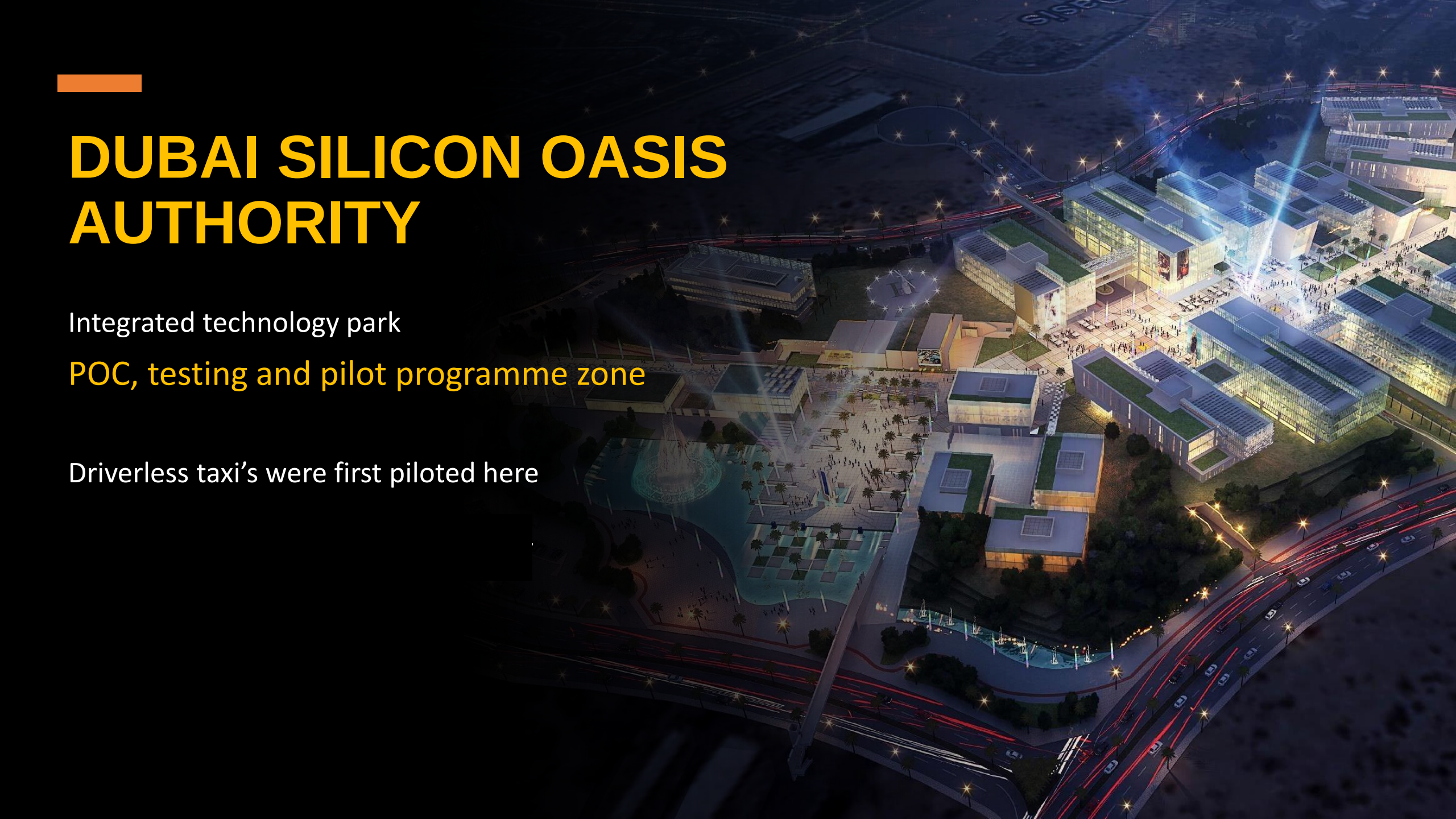
Gaming: dedicated environments for experimentation and radical innovation

Gaming hub of the ME

Incentives to move to UAE

Next big games to be developed in the ME





DUBAI SILICON OASIS AUTHORITY

Integrated technology park

POC, testing and pilot programme zone

Driverless taxi's were first piloted here

DUBAI DIGITAL PARK

150,000 square meters

First smart city project

71,000 sq.m office space

25,000 sq.m commercial space

46,000 sq.m residential area

112 room business hotel

59 furnished apartments



DUBAI FUTURE ACCELERATOR

12-week program

7 x 21st century opportunities:

1. AI and robotics
2. Genomics
3. 3D printing
4. Distributed ledgers
5. Biomimicry
6. Biotechnology
7. New business models



EXPO CITY

EXPO 2020 legacy projects

Innovation hubs

Housing

Resilient communities

Learning spaces



COP28

The world is watching



AREA 2071

Bring together the world's greatest minds to address human needs

AREA 2071: designed to help innovators thrive – both the next generation of Emirati innovators and the best talent from across the world

مجمع أبراج الإمارات للأعمال
EMIRATES TOWERS BUSINESS PARK



10X STRATEGY

The **Dubai 10X** sets the Government of **Dubai** on a mission to be 10 years ahead of all other cities



10X STRATEGY

..and do ten times more
trade with its top ten
trading partners!!



10X STRATEGY

The problem with the
strategy.....

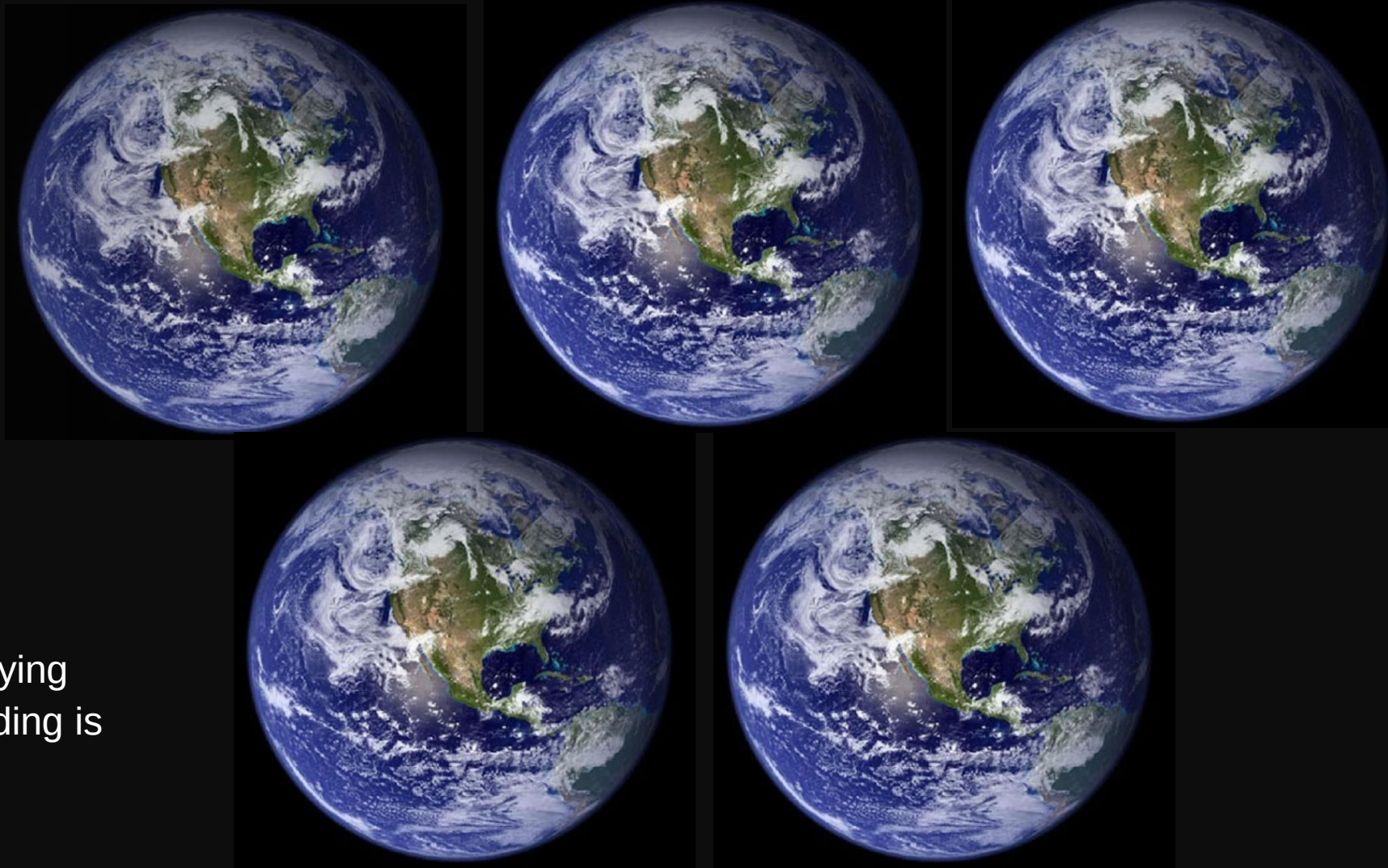


10X STRATEGY

The problem with the
strategy.....

The concept of **capitalism** relying
on economic growth driven by spending is
fundamentally **flawed**.

Sometimes.....being told what you can and cannot
do is necessary as humans can't possibly change
their behaviours in align with the 1.5 deadline.





UAE INNOVATION MONTH

Annual event – one month long

Encourages innovation towards **2071 to** designing the future and enriching the quality of life in the UAE



#UAE
INNOVATION

SPACE EXPLORATION

First satellite: 2020

Mars probe: July 2020



وكالة الإمارات للفضاء
UAE SPACE AGENCY



MBR SPACE CENTRE

The Emirates Mars Mission

July 2020: UAE national and military pilot Hazzaa Al Mansoori joins International Space Station.

Sarah Al Amiri

Chair of the United Arab Emirates Council of Scientists
Deputy Project Manager of the Emirates Mars Mission,
Minister of State for Advanced Technology





MBR SPACE CENTRE

More than a space centre:

Searches for new ways to produce energy, develop and cultivate food crops, and even treat incurable and chronic illnesses

The background of the slide is a night-time photograph of a city skyline, likely Dubai, with illuminated skyscrapers and light trails from traffic on a highway. Overlaid on this image is a network diagram consisting of several white location pin icons connected by thin, white, curved lines, suggesting a global or interconnected digital network.

DIGITAL TRANSFORMATION

Leveraging technology to improve business

Harvesting & understanding data

How data adds insights and intelligence

Differentiating your business (USP)

Open networks with suppliers and customers

Blockchain



ENERGY TRANSITION

COP28



EMERGING TECHNOLOGIES

1001 PhD scholarships

AED850,000p.a. fee!

GBP600,000ea. Or GBP600m for the programme



BLOCKCHAIN



ROBOTICS



DATA SCIENCE



ARTIFICIAL INTELLIGENCE



VIRTUAL REALITY

Pipeline of technically skilled graduates





VIRGIN HYPERLOOP

Dubai to Abu Dhabi in 12 minutes at 1200kph!

Funding boost in July 2020

Will it succeed??



3D PRINTING

World's first 3D printed building

25% of all buildings will be 3D printed by 2030



3D PRINTING

There is progress

EMAAR's new development

Benefits of 3D printing in
construction not clear

Big demand from ODA
countries



MEDICAL INNOVATION

5 SECTOR DRIVERS:

An information revolution is taking place globally – broadband and **data sharing**

AI: to predict and diagnose diseases earlier and more accurately

Genome data – **individualized** treatments

Consumer choice – health provider **comparisons**/reviews

Disruptive business models that blur the lines between practitioners, insurers, healthcare providers and manufacturers



KINGS COLLEGE HOSPITAL, DUBAI



NMC HOSPITAL, ABU DHABI



FINANCING INNOVATION

- Government – Dubai Executive Council – DFF – Incubators - universities
- Banks: Mashreq Bank, EmiratesNBD, HSBC
- Private investors
- Emirati families
- Crowdfunding platforms



FINANCING INOVATION

MAJID AL FUTTAIM

NET WORTH: \$3.6bn

Franchising success: Toyota cars,
Zara, IKEA, Toys R Us and Hertz.

Real estate

Dubai Mall





SHARI'A COMPLIANT FINANCE

Money is a source of **exchange**, not a source of **interest** ('usura')

Absence of interest rates

Future price of asset agreed

Banks owns asset until final payment

Parties share risk



ENERGY TRANSITION

UAE seen perceived as a high consumer of energy

3 of the largest solar farms in the world



Executive Council



The Executive Council - the **main legislative government body** of Dubai. Led by His Highness Sheikh Hamdan bin Mohammed bin Rashid, Crown Prince of Dubai, The Executive Council aims to **positively impact Dubai's governance, trade and culture** in a way that is sustainable and promotes ongoing growth.



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EXECUTIVE COUNCIL

THE UAE equivalent to UKRI

Distribute research funds

DFF main purse keeper



RESEARCH AND DEVELOPMENT PROGRAMME

The programme has **four priority areas**:

HEALTH AND WELL-
BEING

ENVIRONMENTAL
TECHNOLOGY

SMART
BUILT
INFRASTRUCTURE

SPACE AND
AUGMENTED
HUMAN-MACHINE
INTELLIGENCE

The programme's initiatives will be supported by ***disruptive technologies*** such as artificial intelligence, big data, the Internet of Things, blockchain, robotics, drones, 3D printing



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EXPO/COP28: CORE THEMES

BIODIVERSITY



WELLBEING



ENERGY TRANSITION



FOOD SECURITY



EXECUTIVE COUNCIL: CORE THEMES

ENVIRONMENTAL TECHNOLOGY



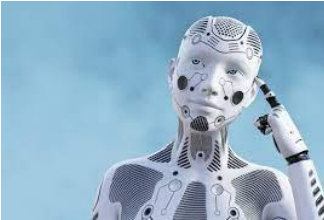
HEALTH AND WELL-BEING



SMART BUILT INFRASTRUCTURE



SPACE AND AUGMENTED HUMAN-MACHINE INTELLIGENCE



UNIVERSITY OF
BIRMINGHAM
DUBAI



DUBAI MUNICIPALITY

Creativity Lab

Platform set up to share ideas and build innovative culture



RTA

Dedicated environments for experimentation and radical innovation

7-week startup programme

Pitch to investors

Funding available (initial and follow-on)

Transport R&D centre at the University (as does Siemens)





DEWA

Solar energy research and
development centre

5th phase, 900 MW of photovoltaic solar panels

Will provide 75% of Dubai's total power output from clean
energy by 2050

Dubai Clean Energy Strategy 2050

Climate action – 3 largest solar farms in the world



A background image showing a police officer in a dark uniform and helmet riding a futuristic, black, four-rotor flying motorcycle. The motorcycle has "DUBAI POLICE" and Arabic text "شرطة دبي" on its side. The officer is in a dynamic pose, leaning forward. The background is a blurred outdoor setting with trees and a fence.

DUBAI POLICE

Innovation Hub

Flying bikes and robotic vehicles to smart police stations and drive-through services

Aim: reduce the number of people coming to police stations by 80%

DUBAI POLICE

Money laundering



DUBAI HEALTH AUTHORITY

Robotics

Genomics

Mental health

Wellbeing



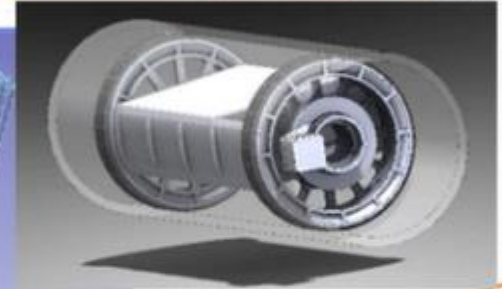
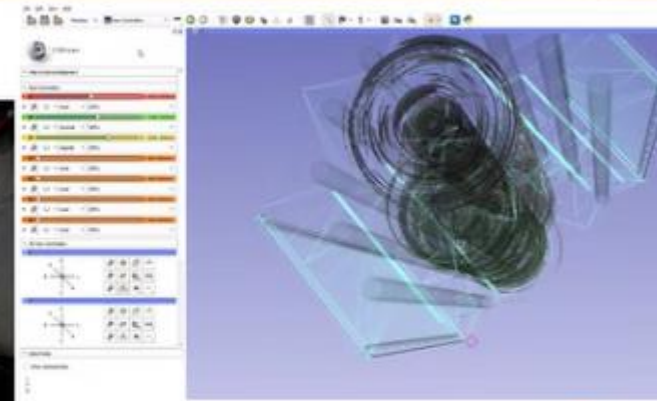
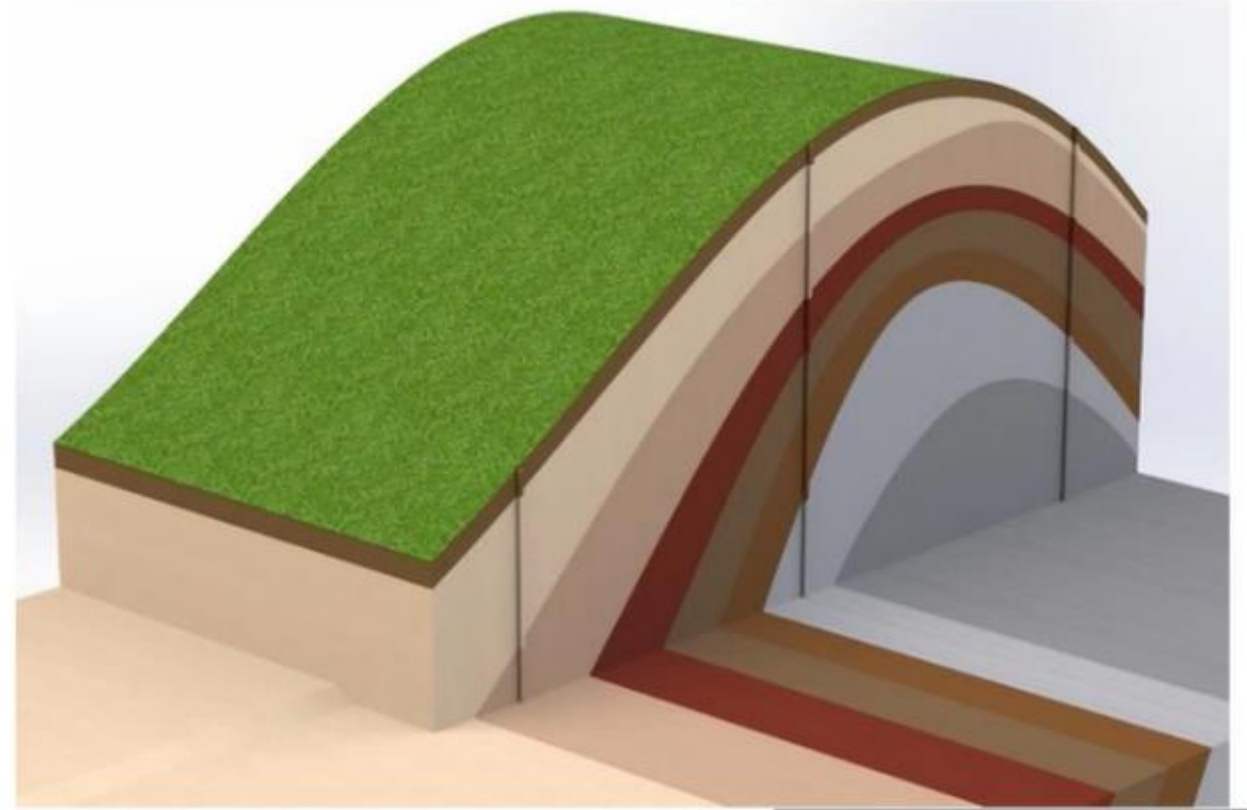
CASE STUDY

hyperTunnel



Phase 1: Preparation

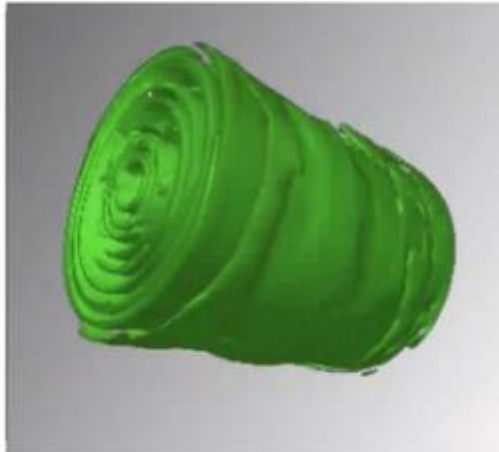
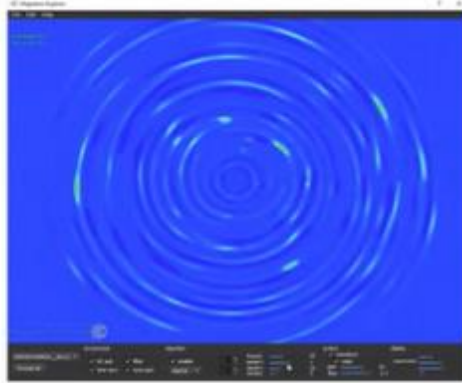
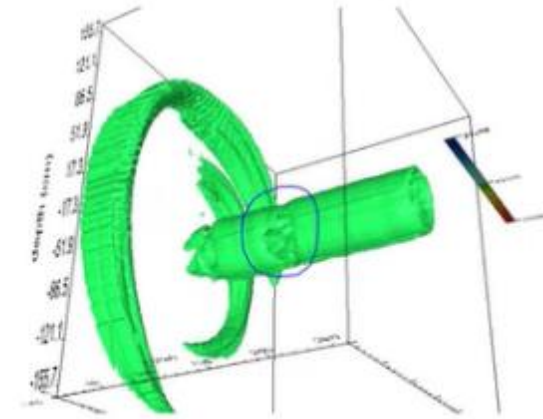
- Continuous **core sampling** provides
 - Data on and extent of rock formations and their mechanical properties, and
 - The basis upon which to estimate groundwater inflow and stabilisation requirements,



Survey Technology

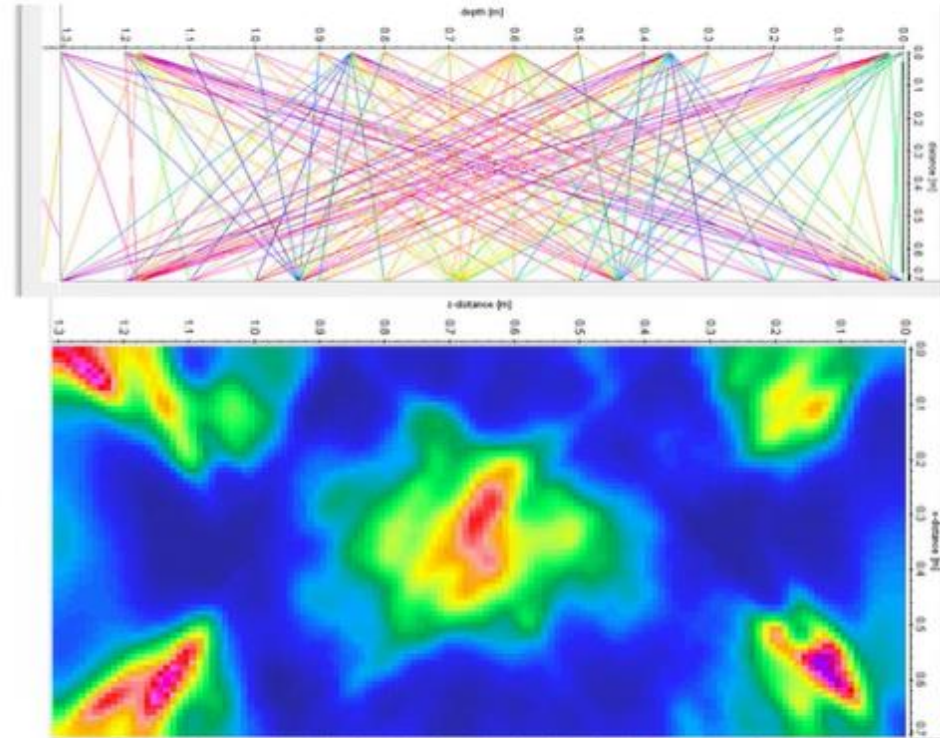
hyperDAR

3D Views of GPR migrated data to identify geological features



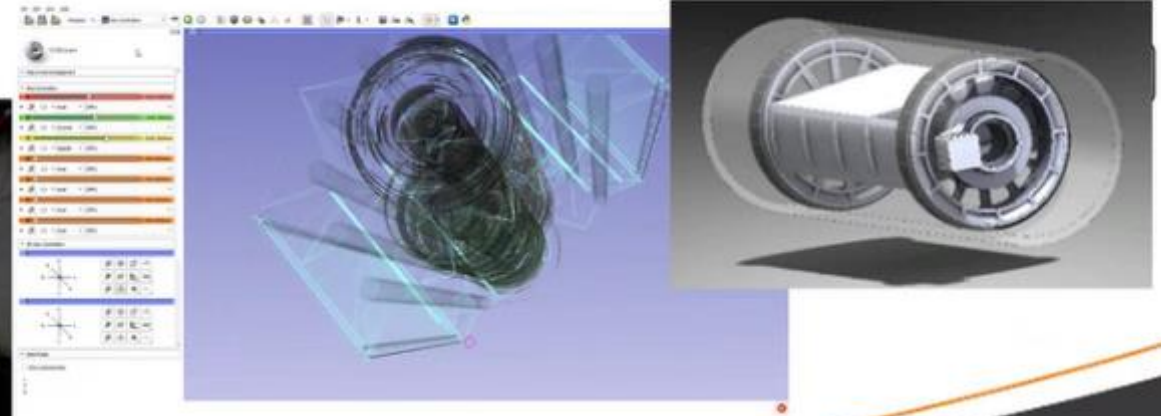
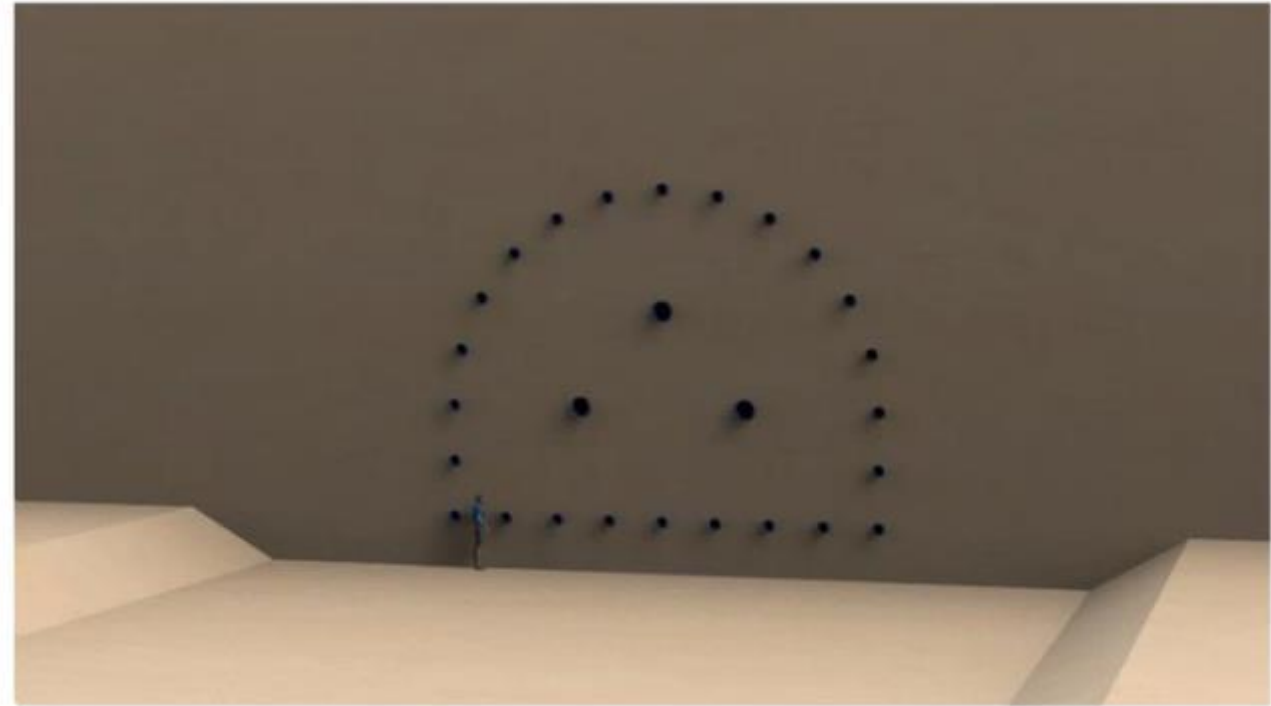
hyperSeis

Tomographic seismic survey in single plane as part of data mesh

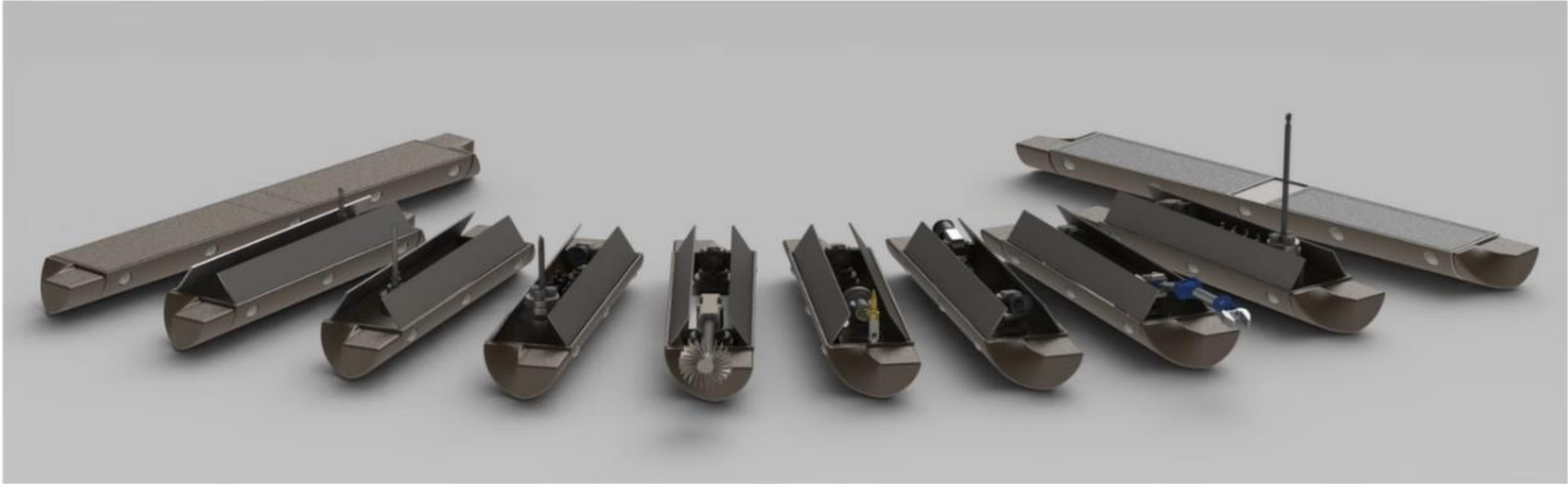


Phase 1: Preparation

- Continuous **core sampling** provides
 - Data on and extent of rock formations and their mechanical properties, and
 - The basis upon which to estimate groundwater inflow and stabilisation requirements,
- Patterned **directional boring**
 - Horizontal Directional Drilling (**HDD**) defines the shape of the tunnel
- Ground penetrating radar (**GPR**) facilitates
 - Accurate visualisation of the geology and obstacles
 - Development of virtual reality imagery
- Building information modeling (**BIM**)
 - Digital twinning



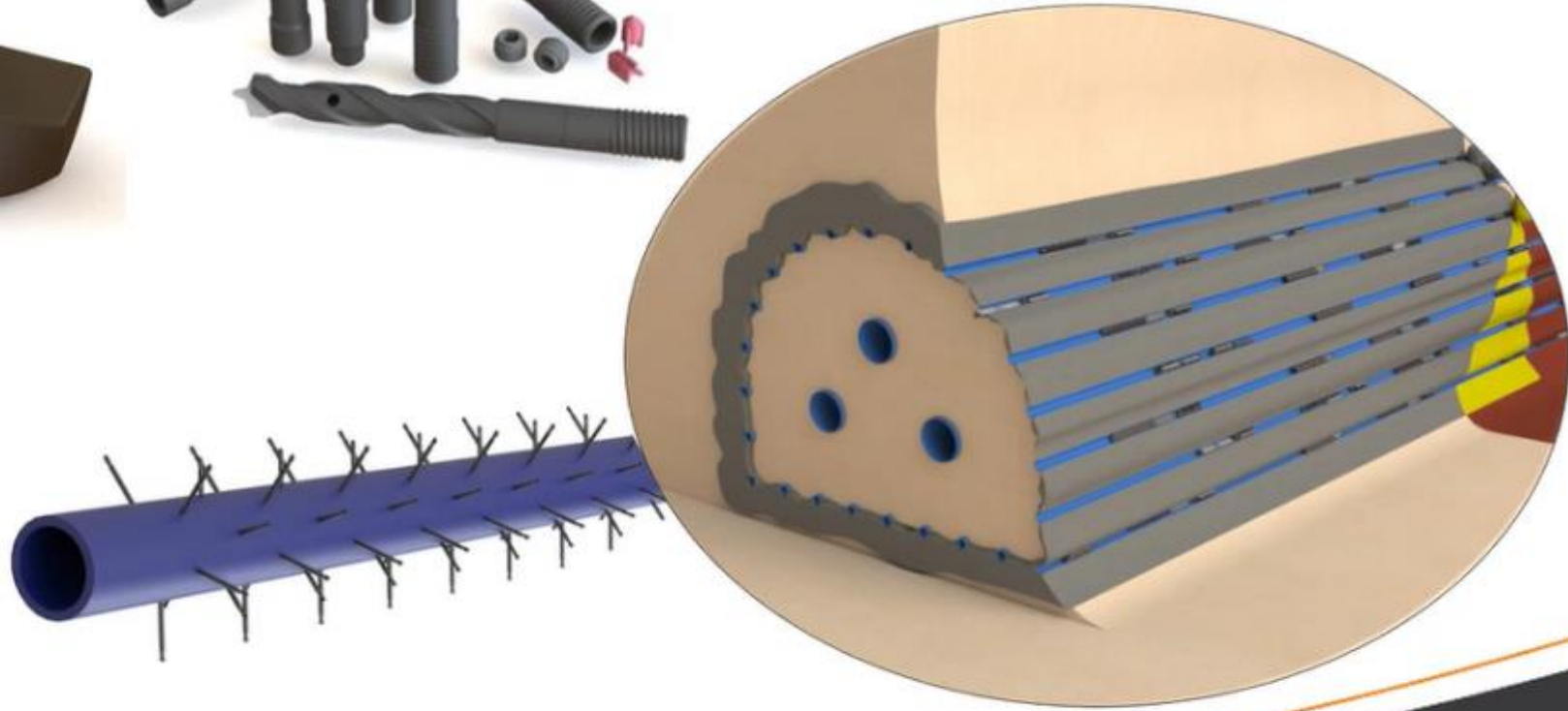
Phase 2: Construction bots to facilitate the hyperSwarm



Phase 2: **hyperBit**



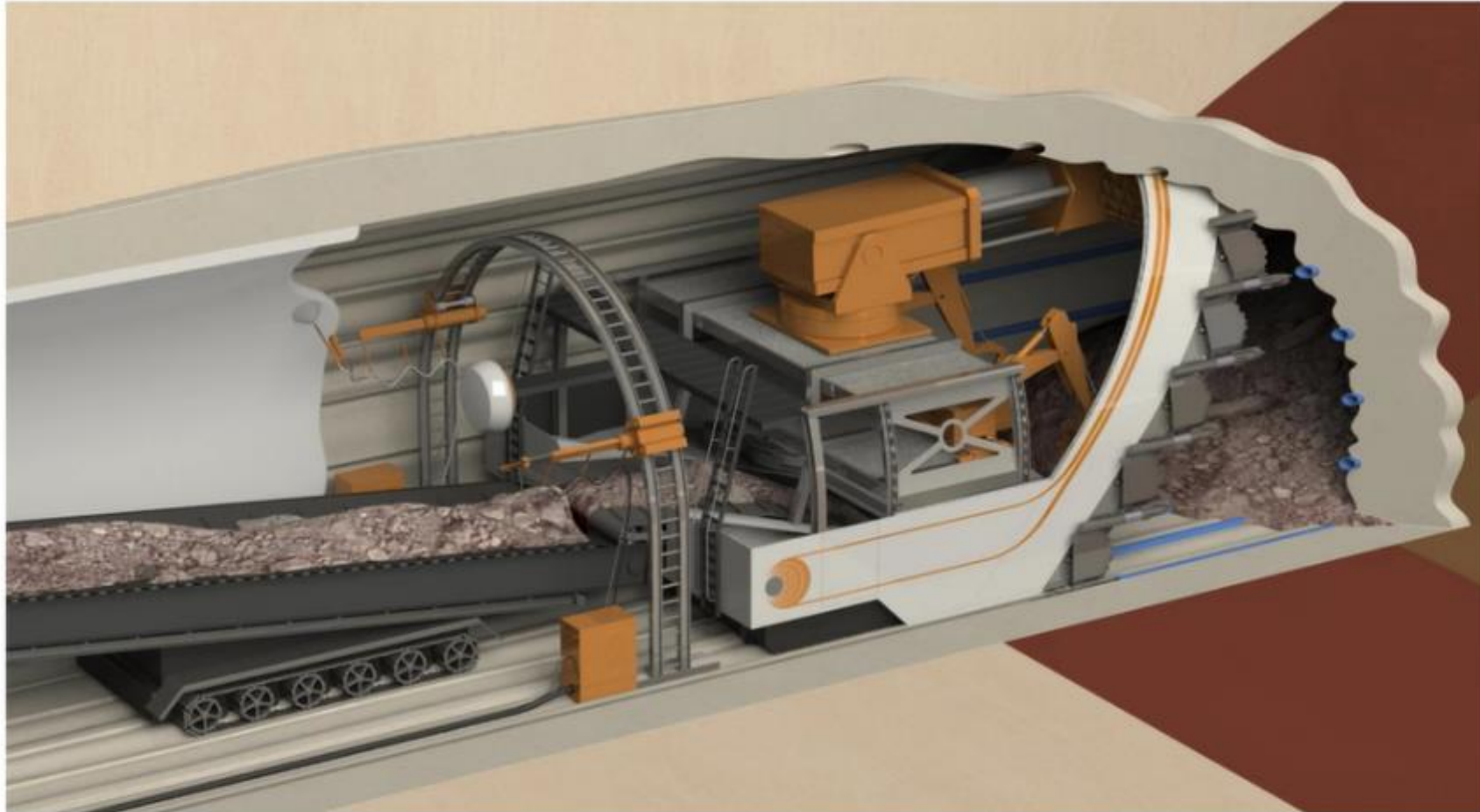
hyperBit



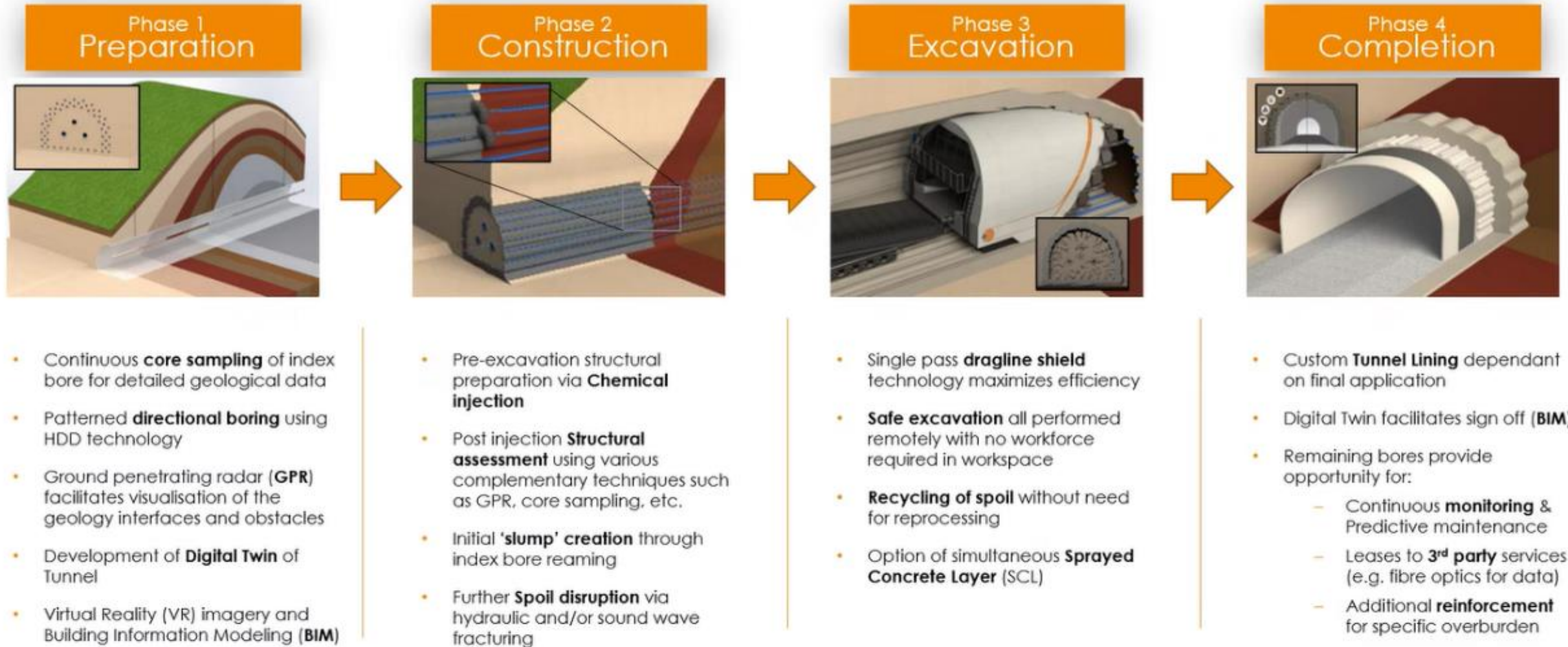
Phase 3: Excavation (for the big jobs)



hyperTunnel dragline shield



4 Phases of the hyperTunnel Process - Summary



An aerial photograph of a sustainable city development. The image shows a large area covered with solar panels, interspersed with green spaces and modern buildings. A prominent feature is a large, circular green area in the foreground. To the right, there's a modern building with a large, curved, green roof. The overall scene is a mix of urban development and nature.

LIVING LAB

CLIENT: THE SUSTAINABLE CITY

SOLUTION:

LONGITUDINAL STUDY
SENSE EVERYTHING!!

AED350m over 10 years

LESSONS FROM BRAZIL



2025: Yanomami Tribe: *Taking from Nature only what she can replenish*

'You have schools, we don't, but we know how to look after the forest.'

Davi Kopenawa, Yanomami



2025: Sustainable City: Yas Island



THE SUSTAINABLE CITY DUBAI



HH Sheikh Mohammed and HH Sheikh Hamdan visit The Sustainable City

TSC is likely to play a high profile role at **COP28**



UNIVERSITY OF
BIRMINGHAM
DUBAI

UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

LICENSED
UNIVERSITY

THE SEE INSTITUTE



Education, research and incubation space dedicated to having a positive **social, economic and environmental** impact



MOU



UNIVERSITY OF
BIRMINGHAM
DUBAI

UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

LICENSED
UNIVERSITY



PREDICTIVE AIR TURBULENCE

CLIENT: EMIRATES AIRLINES

SOLUTION:

DATA SCIENCE

ALGORITHMS

MACHINE LEARNING

SMART SENSING





SUMMARY

Distribute of research and innovation funding is not transparent

No research grant channels

Leads to duplication of effort

Ambitious and often unrealistic

Hypocritical and unsustainable

Omnipresent innovation ecosystem

Expo 2020 legacy?

Population due to double – how does Dubai cope

Russian, Indian, Chinese, Israeli money

Vulnerable lifestyle, but still an exciting place to live!



INTERNATIONAL INNOVATION

Questions

Dr. Roger Griffiths, DBA, FHEA, MIED
Business Development Executive

