

WAPPP · CASE STUDY IN DIGITAL INFRASTRUCTURE PPPs

# Data Centers – Cases from Brazil and Lebanon

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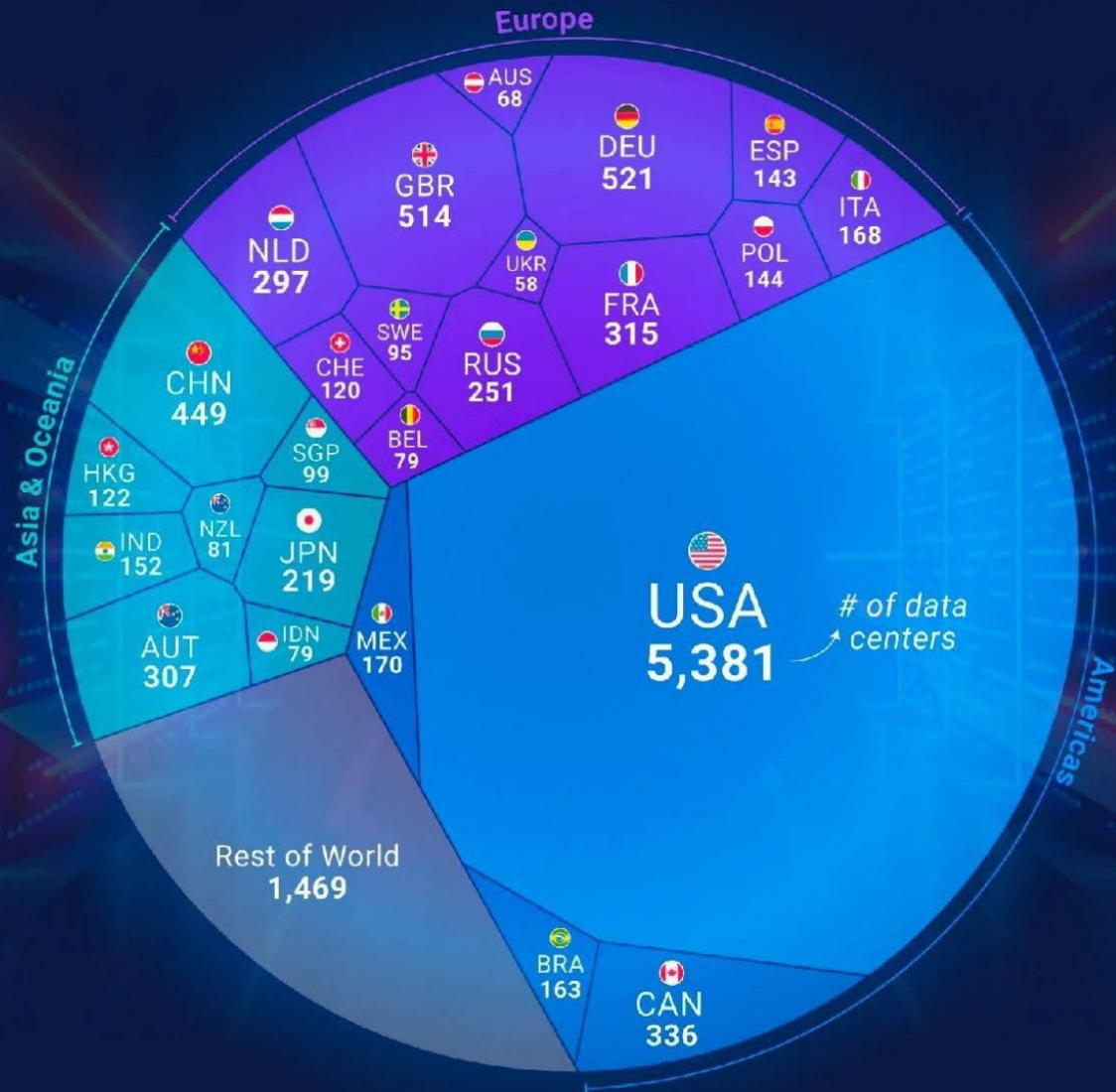
Ziad-Alexandre Hayek · President, World Association for Public-Private Partnerships



# THE WORLD HAS 11,800 DATA CENTERS



MULTILATERAL  
COOPERATION CENTER  
FOR DEVELOPMENT FINANCE

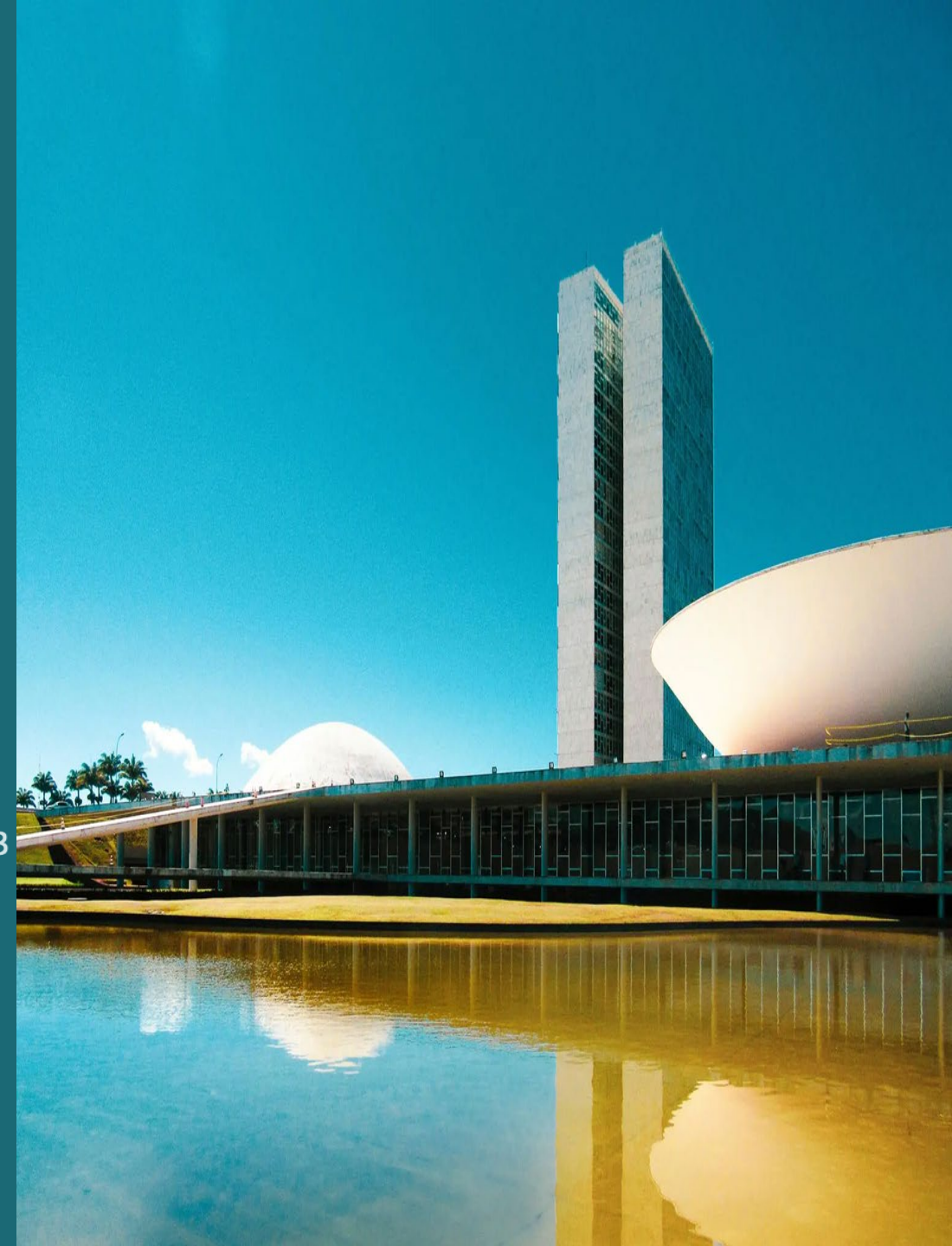


The world distribution of data centers is uneven. Clearly, with increased use of AI everywhere, and the growing need to avoid substantial latency, many more data centers would need to be built in Asia, Latin America, and Africa. Local resources for this massive need for infrastructure are not available. To attract foreign investment and expertise, governments will need to play a role in not only facilitating FDI in data centers, but also de-risking projects for investors. Doing so will require governments to take a much more strategic perspective on this field.

# Brazil's First Federal PPP Was a Data Centre

The Banco do Brasil–Caixa Datacenter Complex, Brasília

An administrative concession under Law 11.079/2004 — signed 2010, operational 2013





# Why This Case Matters

Government data centres are almost always delivered as sovereign-financed EPC builds or as state joint ventures. Genuine contractual concessions — privately financed, risk-transferring, closed and operated — are rare. This is one of them, and it has run nearly a full lifecycle.

**1**

## A true contractual PPP

An administrative concession under federal Law 11.079/2004 — a long-term, performance-based contract between public contracting parties and a private concessionaire. No shared equity, no ambiguity about who is public and who is private.

**2**

## A near-complete lifecycle

Signed in 2010 after successive tenders, inaugurated in March 2013, operating through a 15-year term running to 2028. Most data-centre PPPs are still at feasibility or procurement; this one offers evidence from cradle to maturity.

**3**

## A sovereign digital asset

The complex safeguards the operational continuity of Brazil's two largest public banks — critical national financial infrastructure delivered, financed and serviced by a private partner under contract.



# Strategic Setting: Continuity as the Driver

**Two public banks, one problem.** Banco do Brasil and Caixa Econômica Federal — the country's two largest public financial institutions — each required expanded, modernised data-centre capacity to guarantee continuity of banking operations under prudential rules covering unforeseen events such as power blackouts.

**Regulation, not commerce, set the requirement.** The complex was conceived to reduce operational risk, comply with international IT-security norms for banking, and sustain each bank's growth over a fifteen-year horizon — with shared buildings and services but strictly separated banking technology.

**A shared asset without a merger.** Rather than build twice, the banks co-procured one complex in Brasília's Parque Tecnológico Capital Digital, splitting ownership 80/20 — and let a private partner carry delivery.

## 2

federal public banks co-contracting one shared complex

## 80 / 20

ownership split — Banco do Brasil / Caixa

## 15 yrs

planning horizon for continuity and expansion



# The Transaction at a Glance

## R\$978m

contract value at mid-2010 signature,  
CPI indexed (press-reported: R\$880m)

## R\$322m

investment in the physical complex  
(buildings and plant)

## R\$2bn+

IT equipment procured separately by  
the banks — outside the concession

## 25,000 m<sup>2</sup>

built area on a 40,000 m<sup>2</sup> site, Parque  
Tecnológico Capital Digital, Brasília

## 2010 → 2028

signed mid-2010; inaugurated 20  
March 2013; 15-year term runs from  
acceptance

## GBT S/A

SPV of winning consortium BVA + GCE  
+ Termoeste; built by Consórcio TG

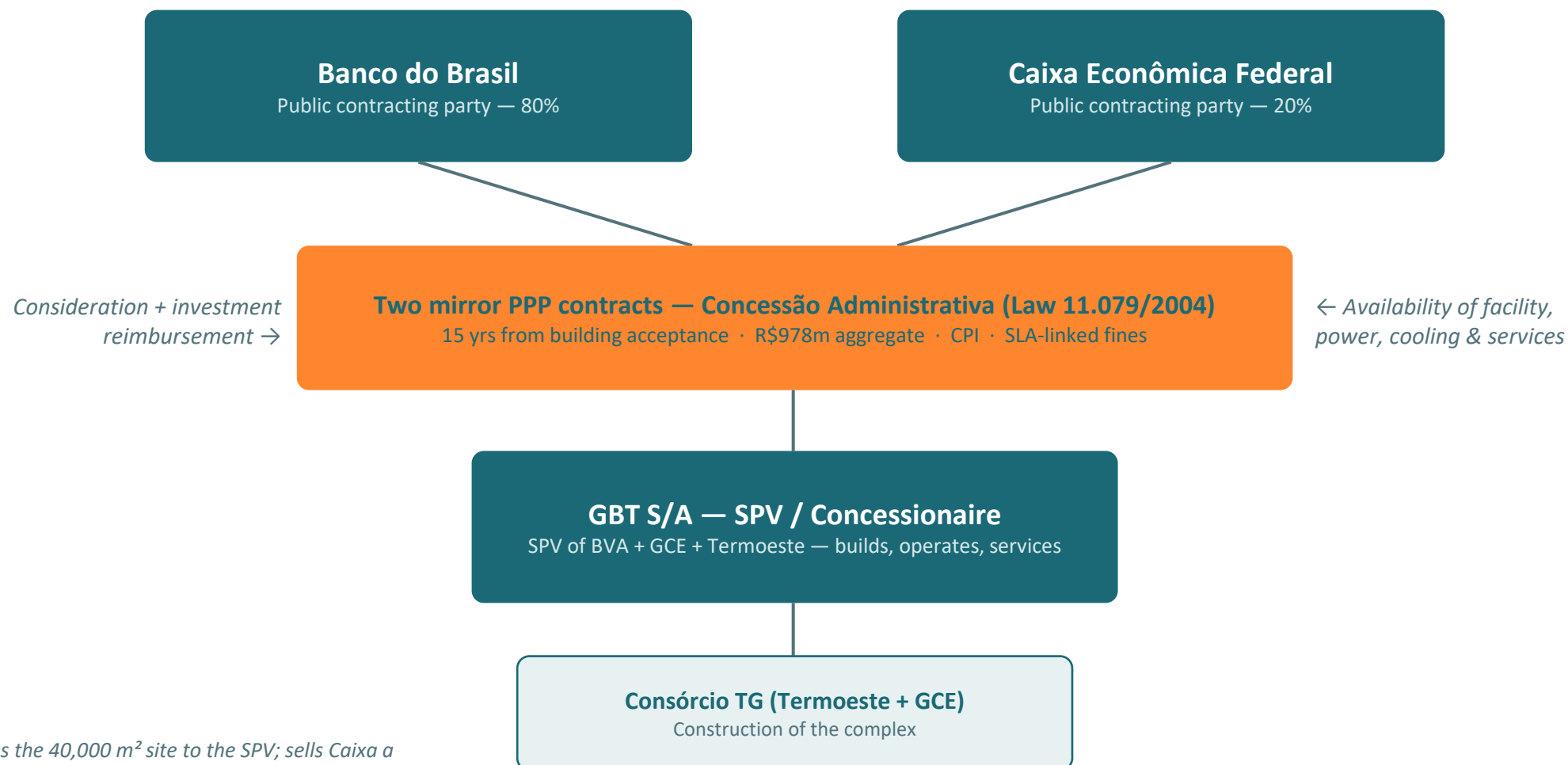
Reported funding by contracting  
bank



■ Banco do Brasil — R\$660m ■ Caixa — R\$220m

*R\$880m aggregate as reported at signature; land split 78.4 /  
21.6*

# Contractual Architecture: An Administrative Concession



Land: BB leases the 40,000 m<sup>2</sup> site to the SPV; sells Caixa a 21.562% fraction (Doc. 03).



# The Scope Boundary: Infrastructure, Not Computing

## PRIVATE PARTNER — THE INFRASTRUCTURE LAYER

- Design, construction and financing of the complex
- Generators, UPS, air conditioning and structured cabling
- Electric power, water, fire detection and suppression
- Facility services: security, cleaning, reception, access control, O&M
- Colocation-equivalent availability across the full 15-year term

## PUBLIC SIDE — THE TECHNOLOGY LAYER

- IT equipment owned and procured by the banks (R\$2bn+), outside the concession
- Technology refresh on the banks' own cycles — obsolescence risk retained where it is best managed
- Banking systems and data remain fully in public hands
- Each bank's technology strictly separated within the shared complex

**The answer to the obsolescence objection: concession the building and its uptime — never the computing.**



# Payment & Performance: The Mechanics in Full

## Two payment streams

A monthly Consideration priced per area category, plus a separate monthly reimbursement of construction investments — both starting only at building acceptance and indexed annually to CPI from an April 2009 base (Cl. 18–19).

## Demand-ramped "virtual areas"

Full-costing area rises 340 → 1,000 m<sup>2</sup> (Caixa) over ten periods, pegged to power at 0.70 kW/m<sup>2</sup>; the banks may trade energy headroom between their mirror contracts without rebalancing the deal (Cl. 18).

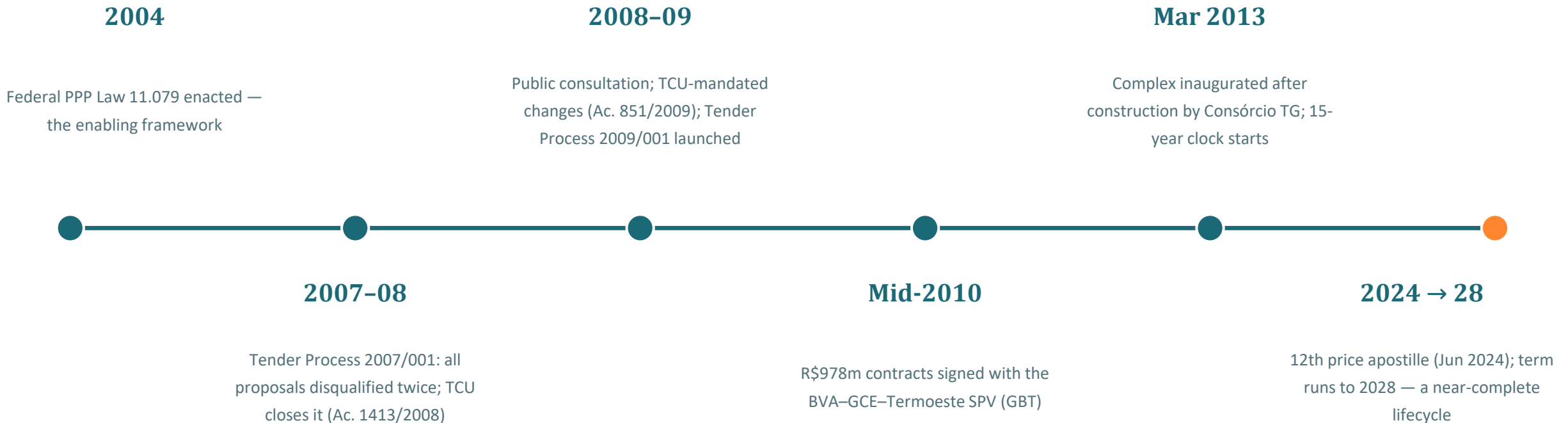
## SLA fines — but no payment guarantee

Progressive per-outage fines reach 20% of the monthly payment, 30% on recurrence, set off directly against payables (Cl. 26). Yet nothing secures the banks' own payments: late payment earns only 1%/month interest plus a 2% fine (Cl. 20).

**Read the imperfections as pedagogy.** The fine-and-set-off regime operates close to an availability-deduction mechanism in practical effect — administered through Brazilian administrative practice rather than an automatic payment formula. The TCU itself shaped the machinery: Court Ruling 851/2009 ordered specific contract changes before the tender could proceed.



# From Statute to Steel: The Procurement Journey



*Friction did not prevent closure: a failed tender and a court of accounts later, the deal was signed, built and delivered.*

# Delivery: A Disciplined, Sustainable Build

The complex was designed as a set of buildings housing and supporting the IT estates of the two banks, with the production block purpose-built for critical load and the whole estate monitored continuously.

Construction followed a clean-build philosophy — pre-moulded elements, minimal losses, low waste — while the engineering was configured to maximise energy use and rationalise cooling demand. Environmental performance exceeded legal requirement: soil permeability of 65%, thirty per cent above the statutory threshold.

**25,000 m<sup>2</sup>**

total built area across the complex

**12,770 m<sup>2</sup>**raised floor across the estate — 5,200 m<sup>2</sup> in the production block**65%**

soil permeability — 30% above the legal requirement

**24 / 7**

uninterrupted monitoring by hundreds of cameras



# Four Lessons for PPP Practitioners

## 1 Scope discipline defeats obsolescence

Drawing the concession boundary at the infrastructure layer — never the computing — reconciles 15-year contracts with 3-year technology cycles. This is the transferable design insight for every digital-infrastructure PPP.

## 2 Pioneering frameworks carry friction

Two tenders and intensive court-of-accounts oversight preceded signature. In nascent PPP markets, friction is a feature of institutional learning — not a verdict on the model.

## 3 Payment security must be engineered

Nothing secures the public side's payments — late payment earns only default interest (Cl. 20). Mitigated here by the payers being Brazil's two largest public banks, it remains the deal's most-cited fragility.

## 4 Demonstration effects are real

Brasília's Federal District government later studied this very complex as the template for engaging private partners in its wider Digital Park — one closed deal seeds a pipeline.

# A data centre was the proving ground of Brazil's federal PPP framework.

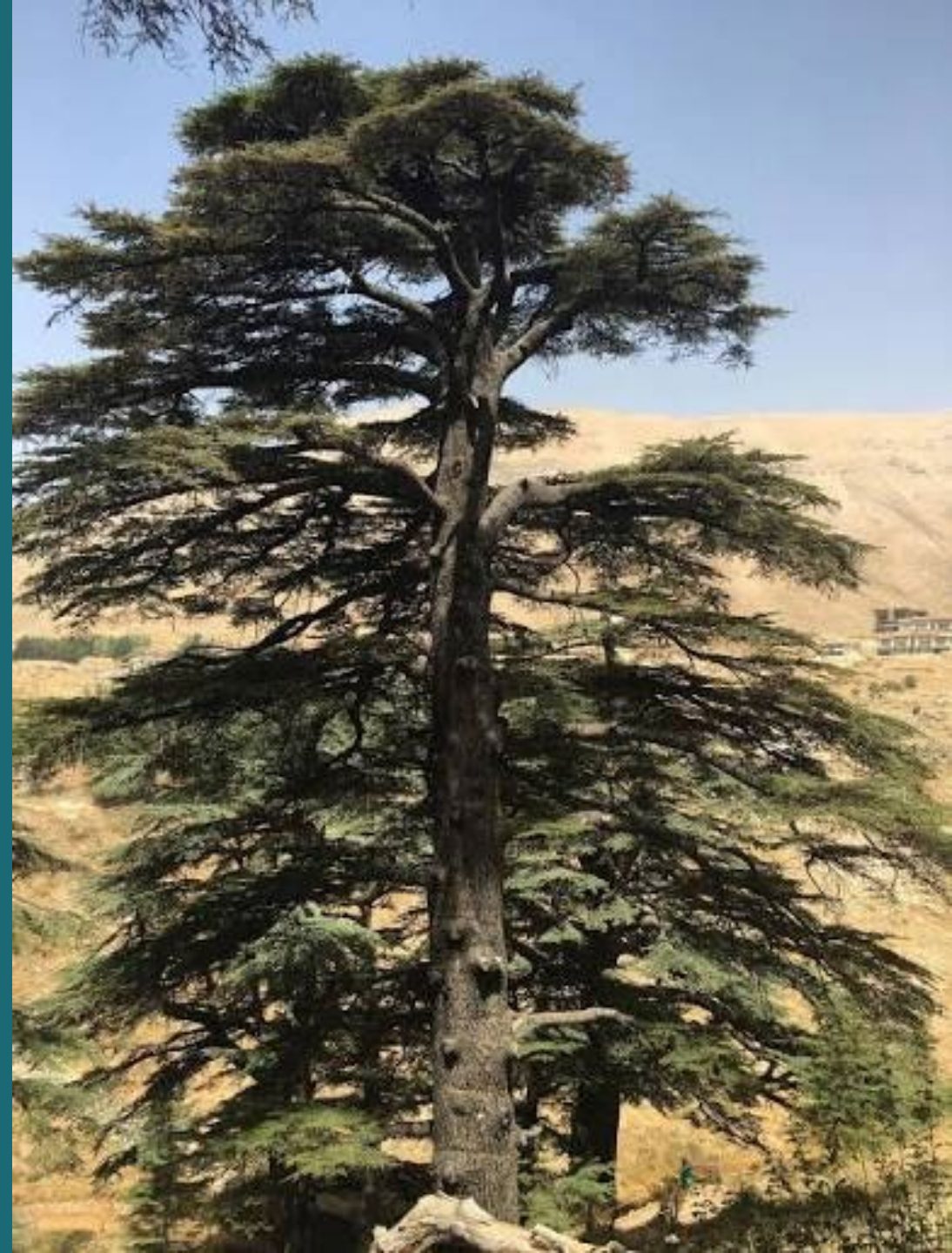
1 Digital infrastructure is concessionable — provided the scope boundary respects the technology cycle.

2 A 15-year lifecycle running to 2028, with a decade of operations on the record, gives this case what almost no other data-centre PPP can offer: evidence.

3 Its imperfections — sanctions-based performance, the missing payment guarantee — are the syllabus for the deals now being structured worldwide.

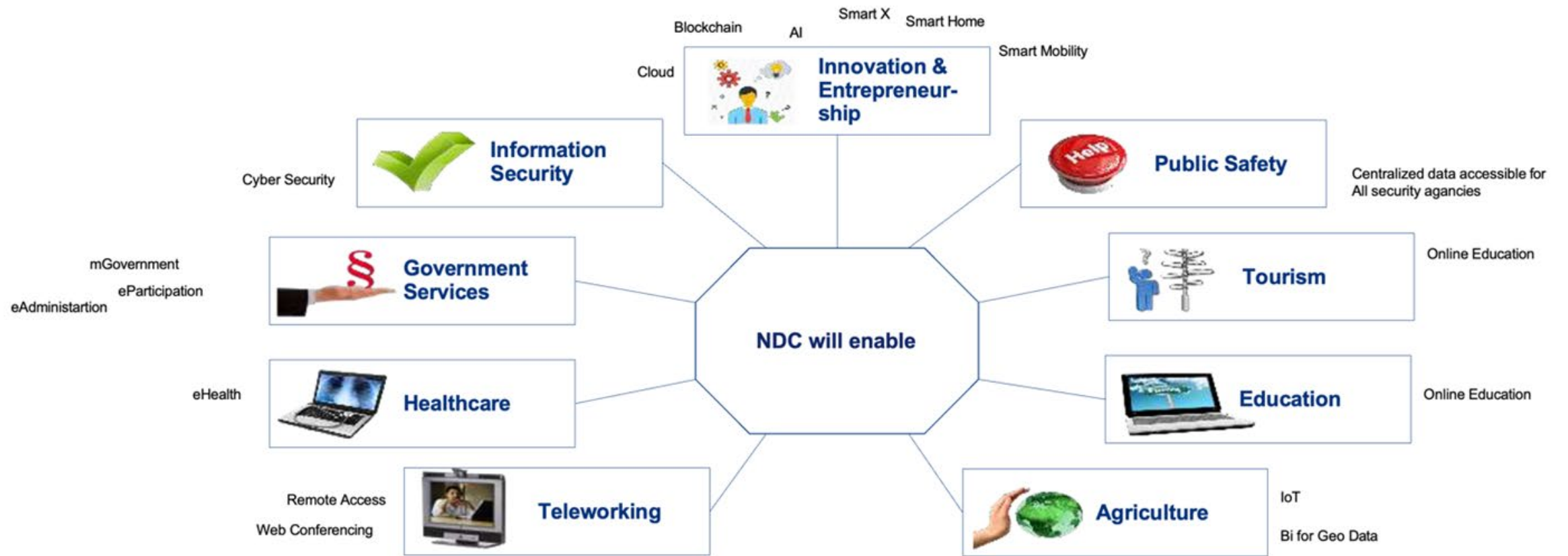
# Lebanon's First PPP Was to be a Data Center

The case of the Ogero National PPP Center

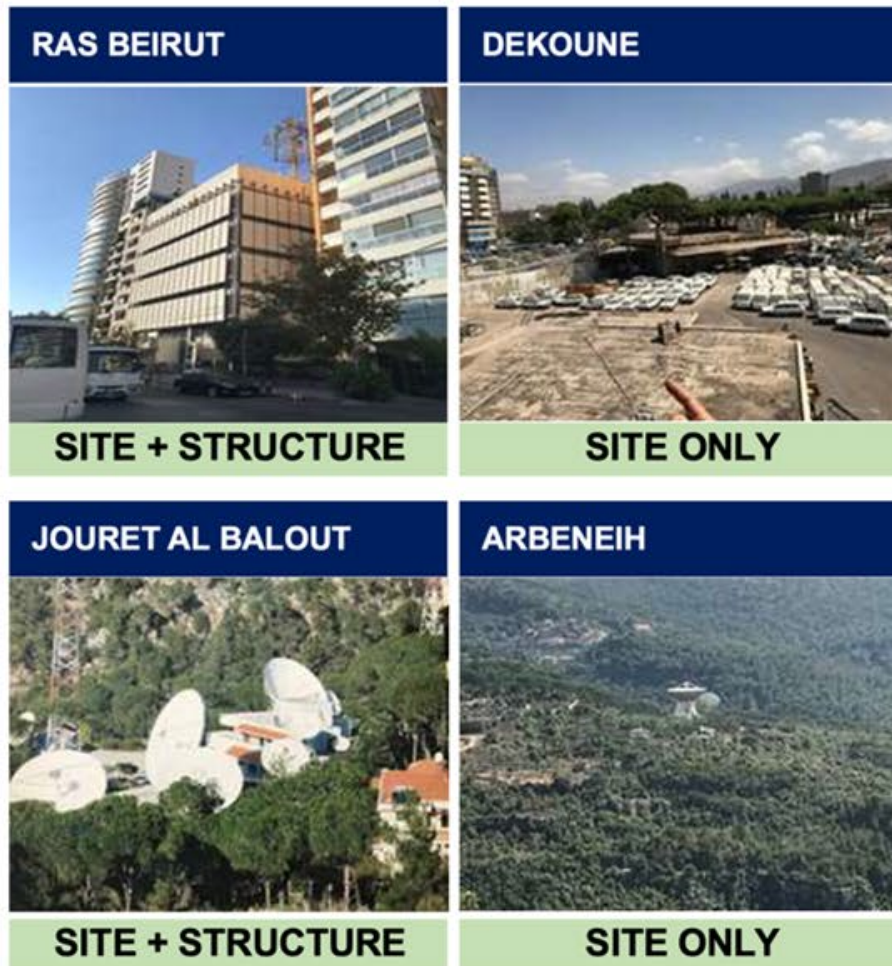


# The Lebanese Government can promote ICT growth, which would subsequently promote economical growth.

One essential ICT growth element is the availability of a state-of-art platform that supports new business



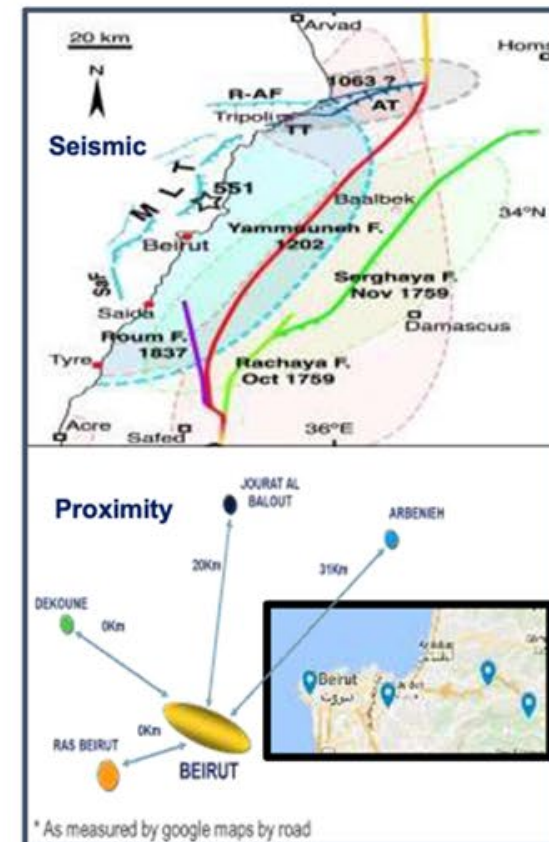
# Four sites are considered as potential locations for the Lebanon national datacenter with candidates identified by ministry of telecommunications



## Space & surrounding



## Connectivity



# Detecon provided questionnaires and conducted several interviews with potential clients to understand their current pain points and future plans.



**DETECON CONSULTING** **MEETING MINUTES** 

**PROJECT NATIONAL DATACENTER**

**Time:** 11:00 - 12:00  
**Date:** 20th of September 2017  
**Place:** OMSAR, Cyber District

**Attendees:** PRESENT:  
 OMSAR  
 Dr. Ali Kaysi  
 Mr. Nabil Al-Jarrah  
 Mr. Jihad Makhadmeh  
 Ogero  
 Dr. Ahmad Al-Jarrah  
 Mr. Ahmad Saleh  
 Dr. Nabil Al-Jarrah  
 Mr. Nabil Al-Jarrah  
 Mr. Nabil Al-Jarrah

**Attachments:** Questionnaire IT, New

**DETECON CONSULTING** **MEETING MINUTES** 

**PROJECT NATIONAL DATACENTER**

**Time:** 13:00 - 14:00  
**Date:** 20th of September 2017  
**Place:** Nicosia, Office, Nicosia

**Attendees:** PRESENT:  
 Detecon team  
 Mr. Gerasimos G. Constantinou (Further reference to be "G2")  
 Ogero  
 Dr. Nabil Al-Jarrah  
 Mr. Ahmad Al-Jarrah

**Please indicate here who provided the information of this worksheet for queries and req. association:**

| Query                      | Information                   |
|----------------------------|-------------------------------|
| 1. Planning / Design       | Mr. Gerasimos G. Constantinou |
| 2. Implementation          | Mr. Gerasimos G. Constantinou |
| 3. Operation / Maintenance | Mr. Gerasimos G. Constantinou |
| 4. Security                | Mr. Gerasimos G. Constantinou |
| 5. Other                   | Mr. Gerasimos G. Constantinou |

**Question**

Which planning guidelines / standards / templates have been used for designing and building the IT applications architecture?  
 - Please provide details about all these planning guidelines and references and documentations, if possible.

Is there a documented target architecture of the IT applications environment?  
 - Please provide the IT applications target architecture and the preceding migration roadmap.

Are you using self-developed or customized software solutions? If yes please provide details about their cloud and virtualization readiness.

What type of security measures do you require in your IT environment (e.g. firewalls, intrusion detection, anti-virus, security, proxy servers)? Please provide details for each of the items you require.

Please provide details about which data privacy policies to be followed regarding data storage and data access.

Please state what kind of backup solution (Desktop, Full, Incremental, etc.) you recommend and supported backup that no backup comes inside the system.

**Answer**

Webinar Standards (http://webinarstandards.com/go/its)  
 Government Forms Standards (Document Attached).

There is no documented target architecture of the IT applications for now other than splitting the system that host the mobile application and the web application from one server to two different servers.

NO, all our used software are well known open source applications and all our systems could be prepared to be virtualized.

1. Firewall based with security zones  
 2. Web Application Firewall with load balancing and SSL offloading  
 3. Intrusion prevention system  
 4. Backup based with security zones  
 5. Application Load Balancer  
 All security devices should be redundant (Active/Standby, Active/Standby) for high availability.

No data privacy policies.

Full, Incremental, and Differential backup. But no backup comes inside the system.

**Based on the analysis, potential clients can be grouped into categories with different priorities for datacenter and cloud services.**

|            | Segments            | Co-Location | IaaS | DR/BC | PaaS | SaaS                |
|------------|---------------------|-------------|------|-------|------|---------------------|
| Category 1 | OGERO, MIC1, MIC2   | ●           | ●    | ●     | ◐    | BSS, Cyber-Security |
|            | Government Entities | ●           | ●    | ●     | ◐    | Cyber-Security      |
| Category 2 | Connect, MTV        | ●           | ◐    | ●     | ○    | Cyber-Security      |
|            | Banks               | ○           | ◐    | ●     | ○    | Cyber-Security      |
| Category 3 | SMEs                | ○           | ○    | ○     | ◐    | ○                   |
|            | Start-Ups           | ○           | ○    | ○     | ◐    | ○                   |

Strong demand for Co-location, IaaS, DR/BC, and SaaS (Mainly cyber Security). Low demand for PaaS which could develop in the future.

 High demand
  Low demand
  Medium demand
  No demand

Cyber-Security: e.g. Antivirus SaaS

# NDC could gain a market share from the existing HW selling segment by offering IaaS services (B2C), providing an IT platform (PaaS and SaaS) enables a step into the IT- services market (B2B2C)

## Assumption:

Based on 2016 market growth  
436,2 m\$

NDC can gain a yearly 5% growth rate  
out of the Hardware selling Market

And,

A yearly 2% growth rate out of the IT-  
Services Market

for the projected time frame

| All Figures in m\$      | 2016   | 2017   | 2018   | 2019   | 2020   | 2021   | 2022   | 2023   |
|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Total Market Value      | 436,20 | 478,51 | 524,93 | 543,50 | 596,22 | 654,05 | 717,50 | 787,09 |
| Hardware                | 261,72 | 287,11 | 314,96 | 328,81 | 343,28 | 358,39 | 374,16 | 390,62 |
| IT Services             | 135,22 | 148,34 | 162,73 | 169,89 | 177,36 | 185,17 | 193,31 | 201,82 |
| Software                | 39,26  | 43,07  | 47,24  | 49,32  | 51,49  | 53,76  | 56,12  | 58,59  |
| NDC Total Revenues      | 0,00   | 0,00   | 0,00   | 19,84  | 41,42  | 64,87  | 90,30  | 121,74 |
| NDC Market Share (HW)   |        |        |        | 16,44  | 34,33  | 53,76  | 74,83  | 101,56 |
| NDC Market Share (IT-S) |        |        |        | 3,40   | 7,09   | 11,11  | 15,47  | 20,18  |



# From various design models which were proposed for the National Datacenter, NDC steerCo selected option B for further analysis

**A**

Disaster Recovery (Out of Beirut)

Asynchronous Paths  $\geq 30$  km

Active Datacenter (e.g. in Beirut)

Cloud Provider

Active Datacenter (e.g. in Beirut)

**Twin Core Datacenter**

- Systems (Compute, Data, Applications) operate in active-active mode.
- Workload is shared between the two datacenters
- Mobility of virtual environments in without down time
- DR site as a backup to ensure data Availability in case of regional disaster (e.g. Earthquake)

**B**

Disaster Recovery (Out of Beirut)

Asynchronous Paths  $\geq 30$  km

Active Datacenter (e.g. in Beirut)

**Multi-Site Datacenter**

- A dual core datacenter model that protects against local and regional incidents (e.g. Outage of one site )
- DR site can be act as Backup and/or passive asynchronous DC
- In case of a complete disaster case in Beirut area, the DR site outside Beirut still able to operate in case Active-Passive model, recovery will take longer in case of Active-DR model

**C**

Fire Containment Zone A

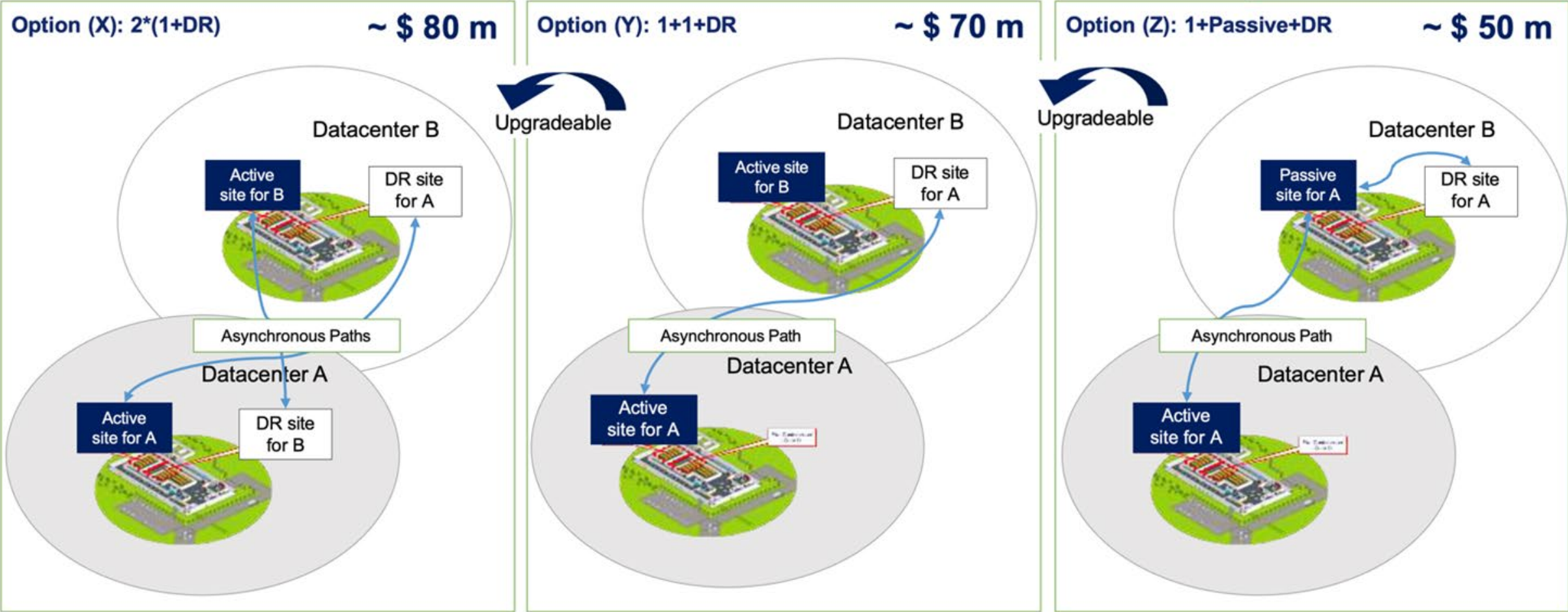
Fire Containment Zone B

**One datacenter, Two separated fire containment zones**

- Always having a second copy of data (e.g. during an IT failure)
- DR model protects against local incidents (e.g. Fire)
- In case of a complete disaster in the local area, data are not protected
- Redundancy can be implemented as Active-Active, Active-Passive, or Active-DR

# The datacenter multi-site building models differ in construction cost (Civil Work and DC Facility) and operation based on the initial set up

Capex Preliminary Estimations,  
Opex is 10-20% of Capex



# Lebanon Cloud / Data Center

## GOVERNMENT ENTITY

Ministry of Telecommunications / OGERO

## PROJECT DESCRIPTION

- Two or more scalable data center facilities and infrastructure based on Tier 3 (maybe Tier 4) standard, offering cloud infrastructure, platform and software services (IaaS, PaaS and SaaS) to both the public and private sectors, with the potential of expanding services in the region.

## OBJECTIVES AND EXPECTED IMPACT

- Enable and promote the ICT sector and leverage the benefits of fiber rollout.
- Create a Lebanon cloud.
- Encourage foreign businesses to establish bases in Lebanon.
- Enable data integration between government entities facilitating the delivery of e-Government services.

## EXPECTED ROLE OF THE GOVERNMENT

- Provide site locations, fiber connectivity and favorable regulatory conditions.
- Provide anchor tenancy (the two mobile companies, OGERO and governmental entities).

## EXPECTED ROLE OF THE PRIVATE PARTNER

- Design, build, finance, operate and maintain the data center infrastructure for 10-20 years.
- Assume the demand risk and recover its investment from user payments.
- Assume the economic ownership of the assets during the life of the contract.

## PROJECT LOCATION

- Several potential locations are proposed; the final location(s) will be decided in consultation with the Private Partner.

## PROJECT TIMELINE

- DeTeCon completed pre-feasibility study.
- HCP retained KPMG and Solon Strategy to advise on the project.
- Expected tender award: End of 2019.

## EXPECTED CAPEX (USD)

- USD 80 – 150 million (depending on design)

**THANK YOU**