Investing in U.S. Infrastructure for Maximum Dividends

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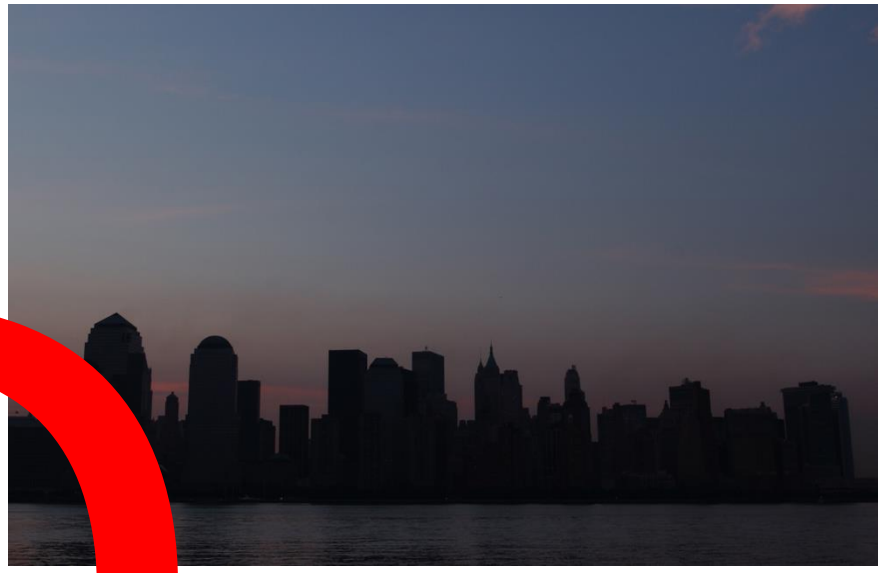
“There are costs and risks to a program of action, but they are far less than the long range risks and costs of comfortable inaction.”

— John F. Kennedy

The cost of underinvestment in resilient infrastructure in U.S is massive

240,000 water main breaks

$18-$38 B Outage Losses



D

$5.5 B hrs Traffic- $120 b fuel

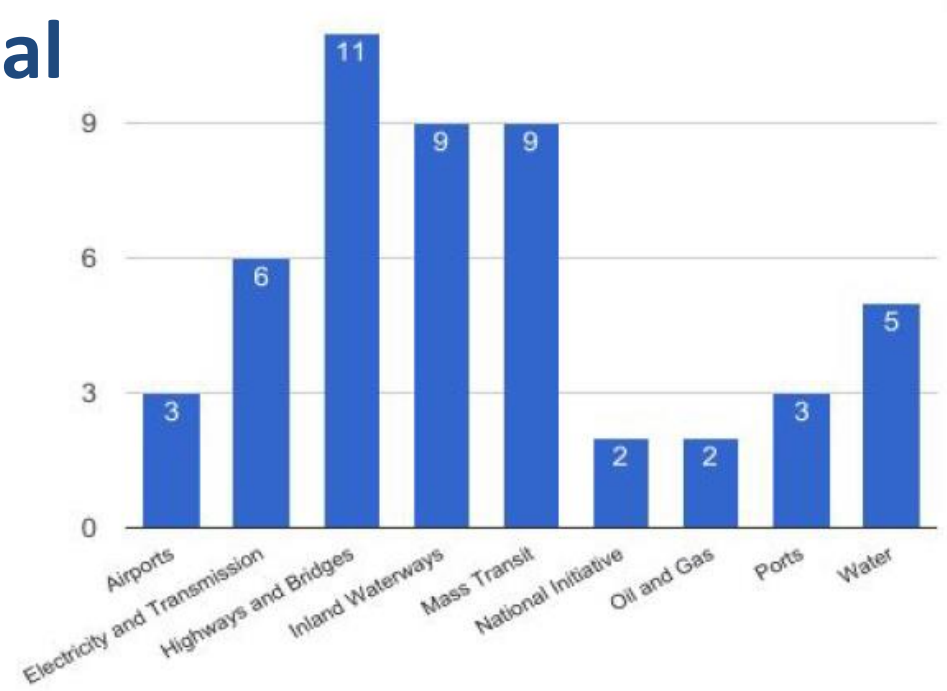
$27 B extra freight costs

$ 137,50 billion

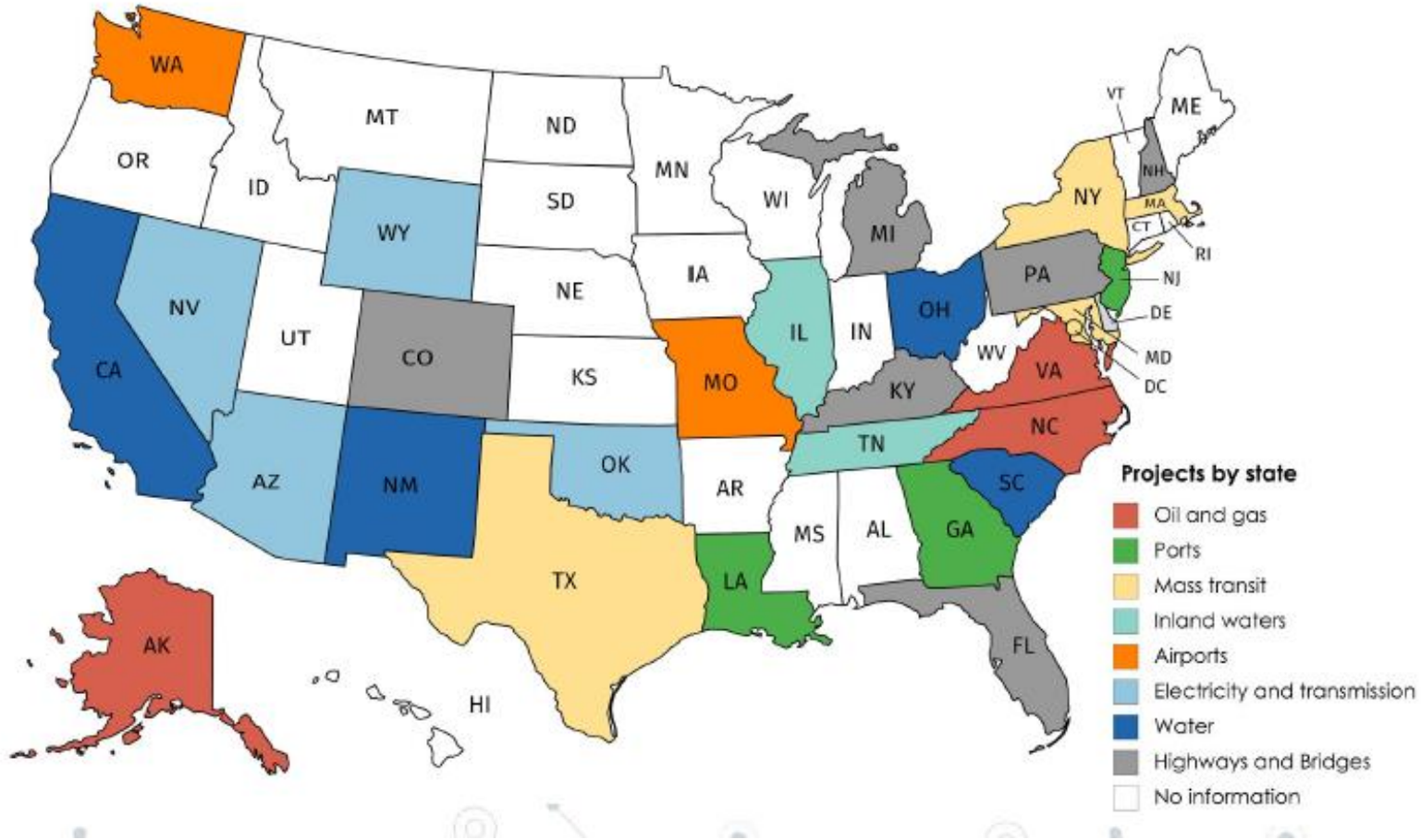
Investment on the 50 projects!!

Emergency & National Security Projects.

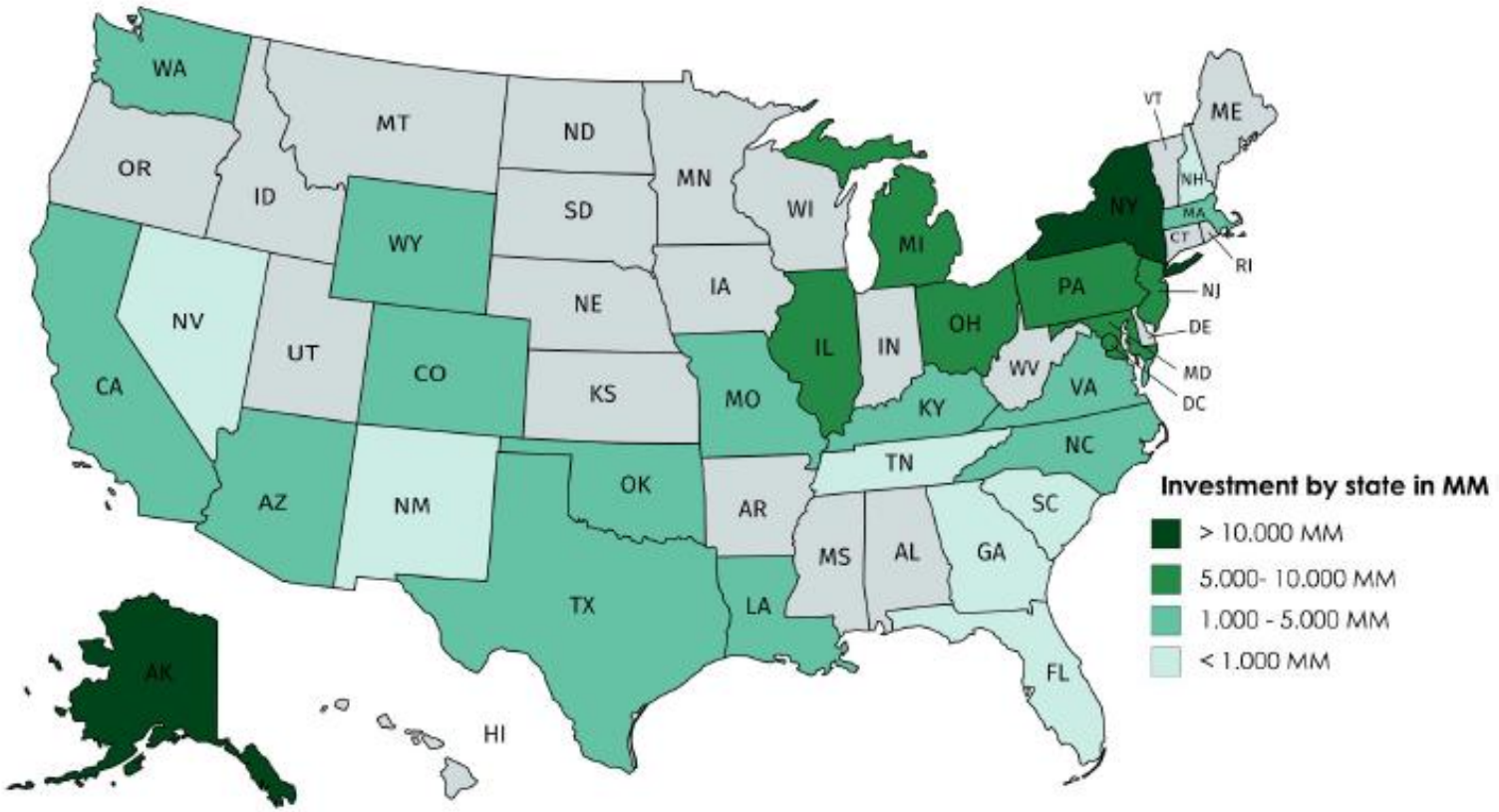
Graphs. Number of projects by category



Distribution of Project Typology by State



Distribution of Investment by State



Public Procurement

Public Private Partnership

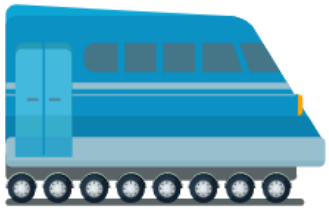
Capital Markets

User Revenues

CAPEX

Tax Revenues

Services



Bankable pipeline of well-prepared resilient infrastructure projects

- Resilient to changes in weather patterns due to climate change

- Resilient to cybersecurity attacks

- Resilient to government budgetary changes

  Infrastructure bottlenecks arise in when spending is tied to annual budgets

INFRASTRUCTURE LIFECYCLE

When is Bankability Determined ?

Planning and Identification

- From Problems to Projects
- Master Planning
- Project Prioritization

← Cost Benefit Analysis

Project Preparation Process

- Stakeholder Consultation
- Pre- Feasability and Feasability studies
- Analysis of procurement options (PPP vs. Traditional procurement) - VFM Tools-

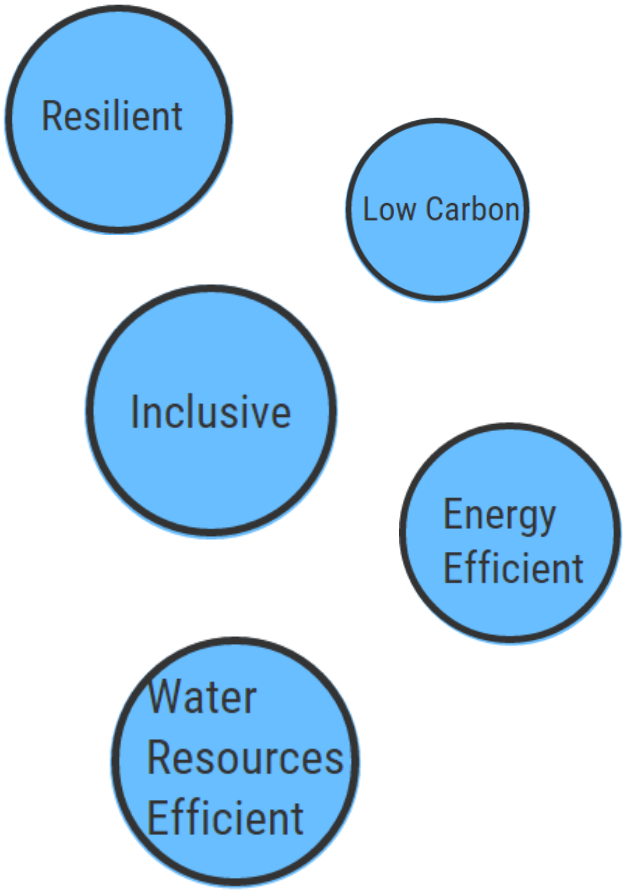
← Factor - in Externalities

The Moment of Truth →

Promotion and Financial Closing

- Bundeled/ Unbundled
- Parametric Investment Analysis
- Capital Stucture, Type of instruments

Financiers Investment Parameters



ROI

Return on Investment

Private Investors/ Operators

- Initial CAPEX
- Projected Revenue (Cashflows)
- Projected OPEX

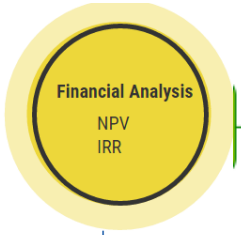
DSCR

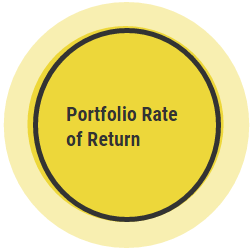
Debt Service Coverage Ratio

Debt Holders (Banks)

- Interest Rate
- IR Risk premium
- Capital structure
  -> (%Debt vs. % Equity)

Project Finance Discounted Cashflows





NPV

the PV of the cash flows less the initial (time = 0) outlay

$NPV = \sum_{t=0}^{N} \frac{CF_t}{(1+r)^t}$

where:
CFt = the expected net cash flow at time t
N = the estimated life of the investment
r = the discount rare (opportunity cosr of capital)

Decision rules:
- Accept projects with a positive NPV
- Reject projects with a negative NPV
- Two mutually exclusive projects: accept higher positive NPV

IRR

is the discount rate that make the NPV of a project equal to zero

$CF_0 + \frac{CF_1}{(1+IRR)} + \frac{CF_2}{(1+IRR)^2} + \ldots + \frac{CF_t}{(1+IRR)^t} = 0$

Problems:
- Conflict with NPV due to
  - Different project size: the smaller projects may have higher IRR but their contribution to the firm value may be smaller compared to the larger projects
  - Differen timing of cash flows
- Multiple IRR or No IRR
  - When CFA pattern is unconventional
- Unrealistic assumptions
  - IRR method: project cash flows are assumed to reinvest at IRR while with NPV it is assumed to reinvest at market rate
  - --> at the bottom lines: use NPV

Decision rules:
- Accept projects with an IRR > the firm's (investor's) required rate of return.
- Reject projects with an IRR < the firm's (investor's) required rate of return.

For single project, IRR and NPV lead to exactly the same decision

Discount Rate

Risk Free Rate + Risk Premiun

Bank discount yield

1. Based on face value, not price
2. Use 360-day
3. Use simple interest, ignore reinvestment of interest

Not much meaningful

$$r_{BD} = \frac{D}{F} X \frac{360}{t}$$

Where:
r_{BD} = the annualized yield on a bank discount basis
D = the dollar discount, which is equal to the difference between the face value of the bill and the purchase price
F = the face value (par value) of the bill
t = number of days remaining until maturity
360 = bank convention of number of days in a year

Holding period yield

$$HPY = \frac{P_1 - P_0 + D_1}{P_0} = \frac{P_1 + D_1}{P_0} - 1$$

Where:
P_0 = initial price of the the instrument
P_1 = price received for instrument at maturity
D_1 = interest payment (distribution)

Effective annual yield

$$EAY = (1 + HPY)^{365/t} - 1$$

Money market yield

$$r_{MM} = HPY \times (360/t)$$

Bond equivalent yield

BEY = 2 x semi annual discount rate

Portfolio Rate of Return

Money Weighted

defined as the IRR

More appropriate if manager has complete control over cash in/out

Time weighted (chain-link)

measures compound growth

Not affected by cash in/out

Preferred method

3 steps:
- Value the investment immediately after any withdrawals or deposits, divide the overall investment horizon into subperiods
- Calculate HPR for each subpediod
- Compute the geometric mean

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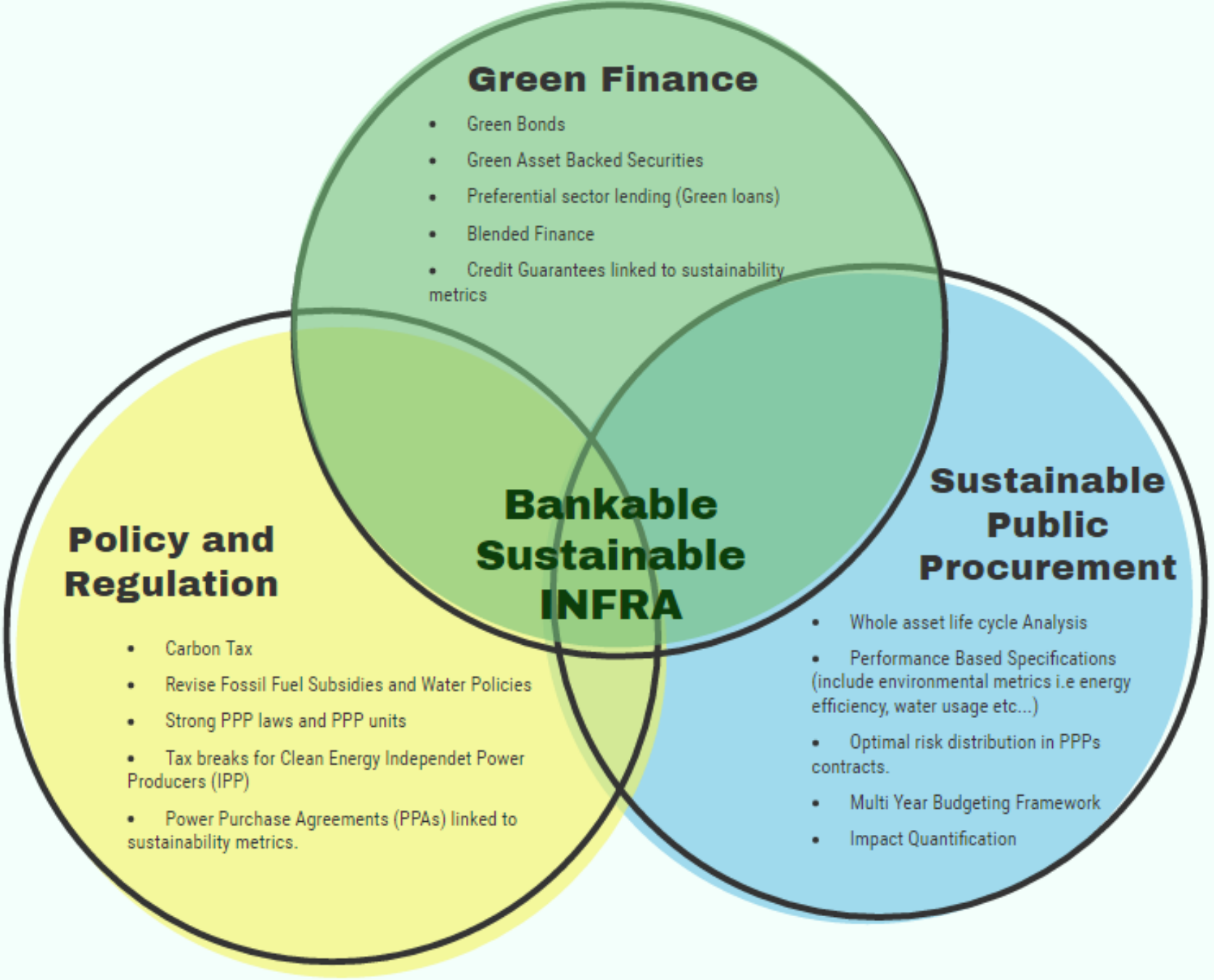
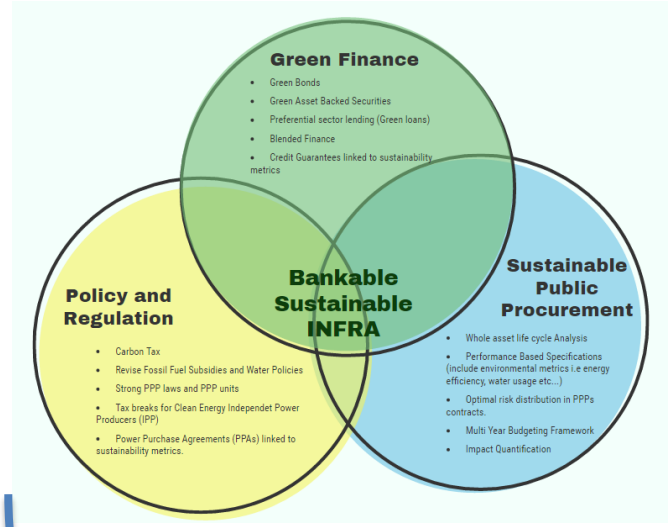
Construction and Monitoring

- Solid Track Record
- Social and Environmental Impact Assessment
- Creation of Benchmarks


Green Finance
Green Bonds
Green Asset Backed Securities
Preferential sector lending (Green loans)
Blended Finance
Credit Guarantees linked to sustainability metrics
Bankable Sustainable INFRA
Policy and Regulation
Carbon Tax
Revise Fossil Fuel Subsidies and Water Policies
Strong PPP laws and PPP units
Tax breaks for Clean Energy Independet Power Producers (IPP)
Power Purchase Agreements (PPAs) linked to sustainability metrics.
Sustainable Public Procurement
Whole asset life cycle Analysis
Performance Based Specifications (include environmental metrics i.e energy efficiency, water usage etc...)
Optimal risk distribution in PPPs contracts.
Multi Year Budgeting Framework
Impact Quantification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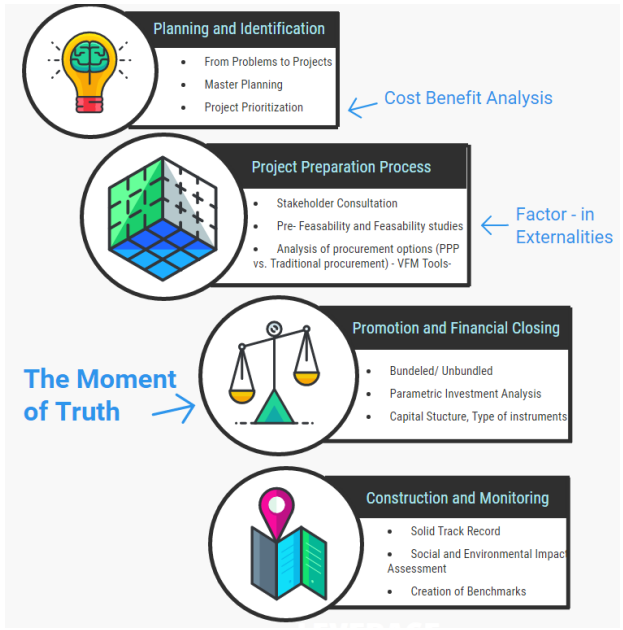
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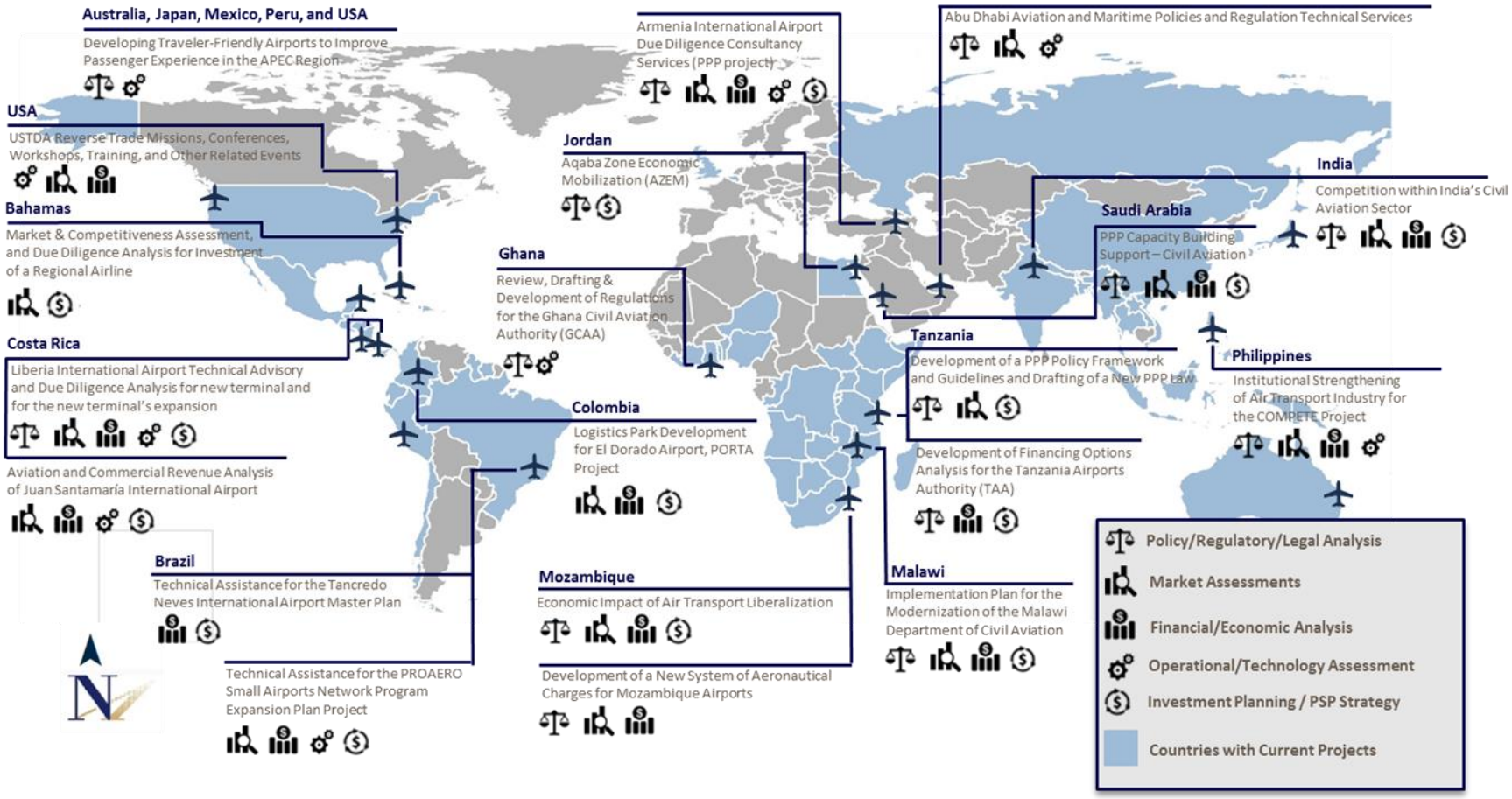
Good Examples

Energy Efficiency Financing

Property Assessed Clean Energy (Pace) financing

Our Infrastructure experience



Thank You!

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