

Infrastructure Prioritization Framework: A tool to support infrastructure planning processes

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Public-Private Partnerships Group and
Singapore Infrastructure & Urban Development Hub

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Introduction

Introduction (1/2)

Governments face challenges for infrastructure planning:

- Investment needs in all sectors
- Limited public resources and fiscal restrictions
- How to optimize the use of public resources?
- How to compare different investment options?

Need for an objective system to prioritize infrastructure investments.

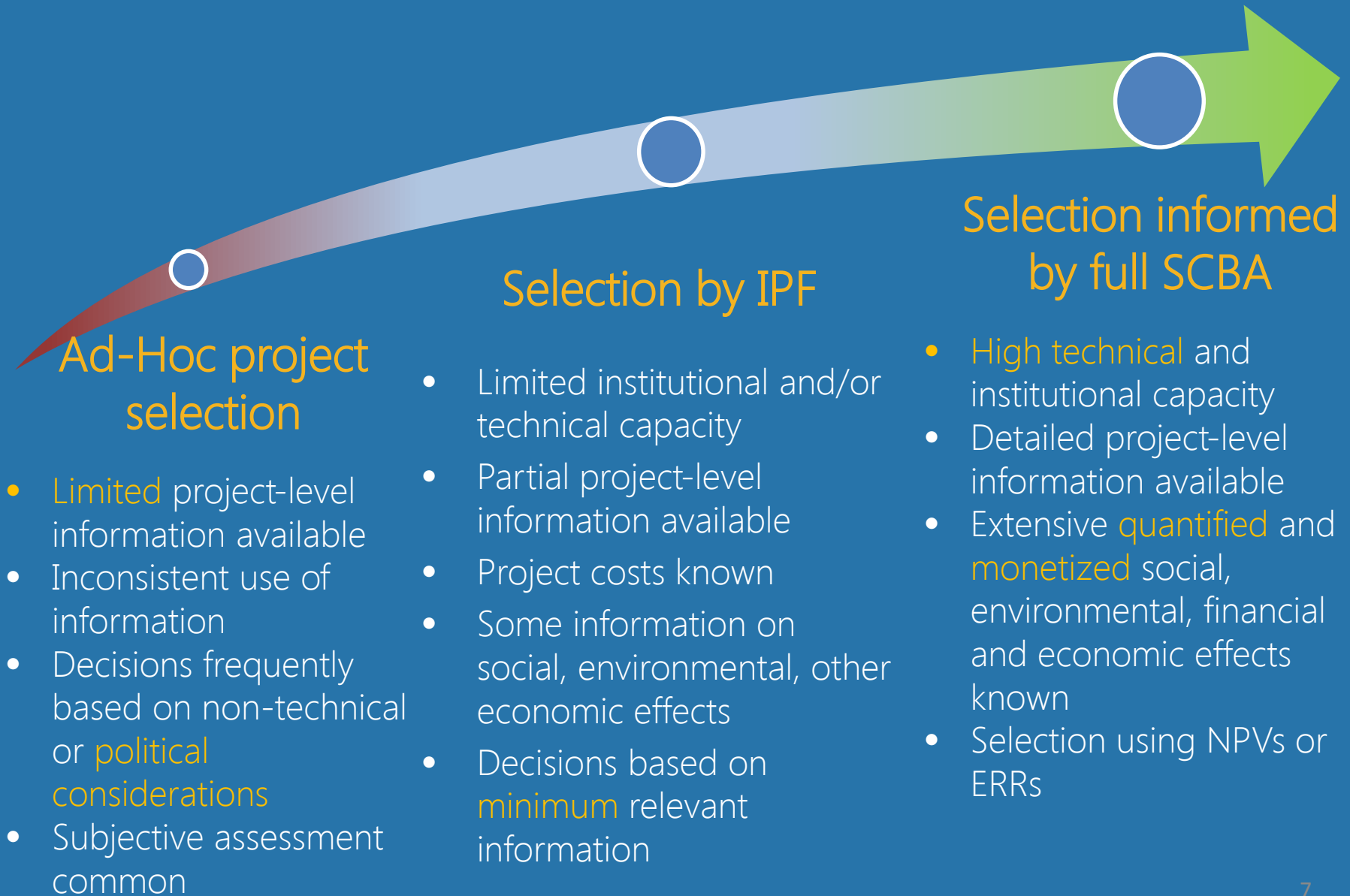
Introduction (2/2)

Common challenges at the project level

- Limited / inconsistent project data availability & quality
- Limited technical and institutional capacity
- High costs and extensive time required to do SCBA appraisal across large sets of projects
- Problems in data comparability
- Reversion to political selection

Infrastructure Prioritization Framework (IPF)

IPF as a Stepping Stone





Advantages of the IPF

The IPF is a **multi-criteria** approach to project prioritization

1. Can be **adapted** to account for policy goals*
2. Combines **social-environmental** and **financial-economic** variables
3. Accommodate **data** and **resource limitations**
4. Includes the sector **budget constraint**
5. Displays information in a **simple visual interface**
6. Informs discussion of **rebalancing** sector allocations
7. Improves **data collection** processes*

The IPF Process

I. Define Criteria

Consensus between decision makers, experts, and key stakeholders

II. Prepare Data

Source project data (CBA elements incorporated when available)

III. Construct Performance Indices

Includes statistical / mathematical methods to combine selected variables into two dimensions

IV. IPF Matrix

Combine SEI, FEI, and budget constraint to create a four-quadrant matrix

V. Select Projects

Based on informed deliberation

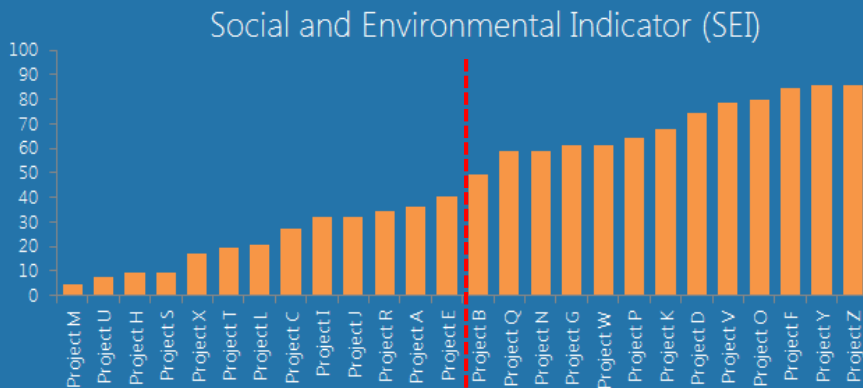
Two-Dimensional Structure

Social-Environmental Indicators (SEI) (example)

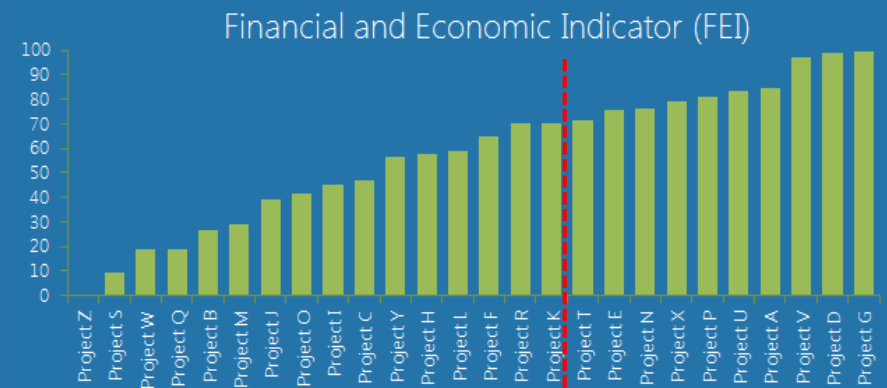
- Beneficiaries*
- Affected population*
- Environmental effects*
- Poverty levels*

Financial-Economic Indicators (FEI) (example)

- vs.
- Benefit-cost ratio*
 - Multiplier effects*
 - Externalities*
 - Implementation risks*



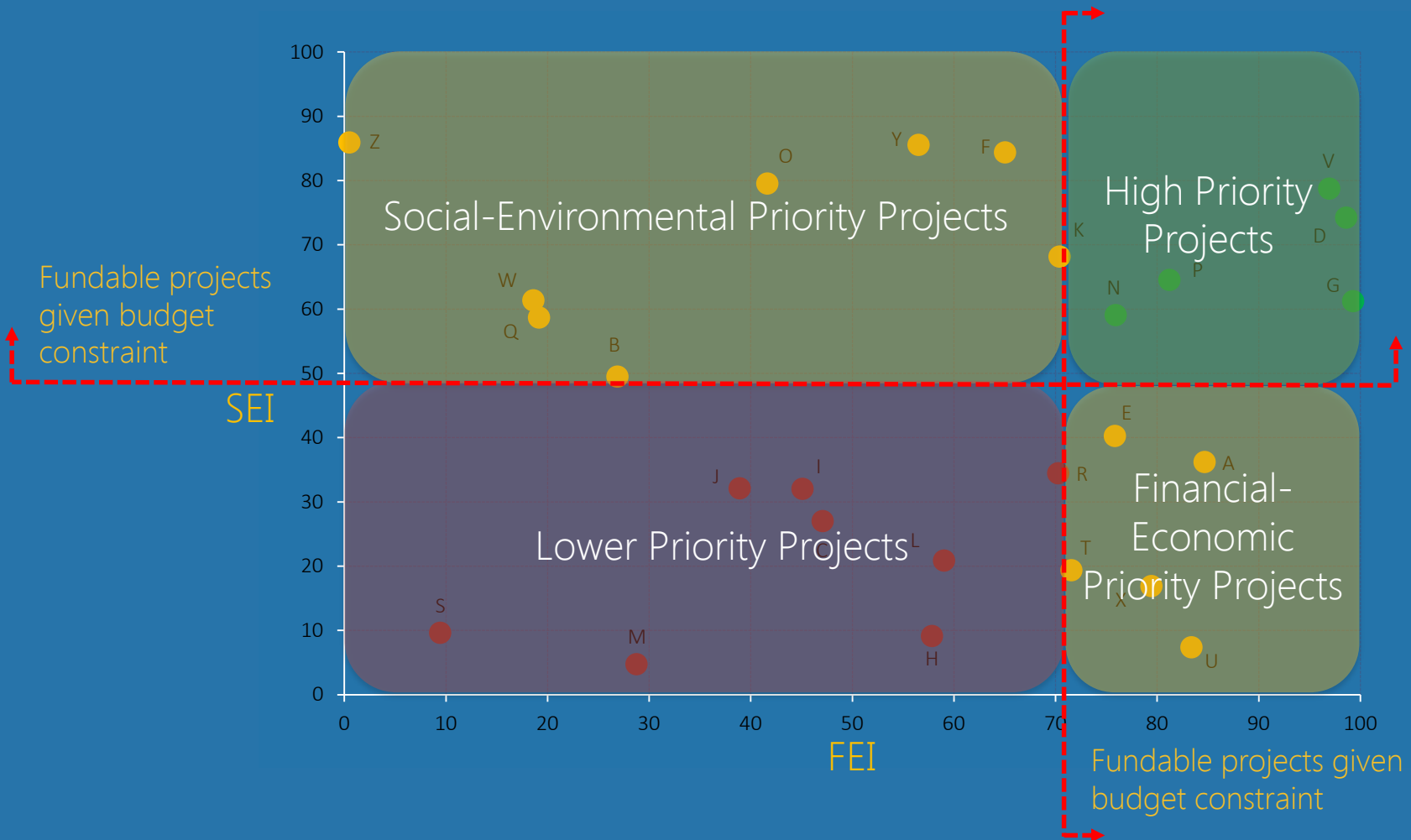
Fundable projects given
the budget constraint



Fundable projects given
the budget constraint

IV. IPF Matrix

- (x, y) coordinates are defined by the (FEI, SEI) score pair





IPF: Methods

1. Principal Component Analysis (**PCA**) to combine criteria
 - Maximization problem with one constraint*
 - Maximization problem with two constraints*
2. **Sensitivity analysis** to compare results with other weighting methods
 - Subjective weighting (AHP)
 - Simple average



Pilots:*

Argentina (irrigation)

Sri Lanka (Roads)

Vietnam (Transport, Urban)



Argentina: Irrigation (1/3)

- 45 irrigation projects pre-identified by the government
- The goal is to prioritize and explore PPP scheme options
- The process included experts / decision-makers from Ministry of Public Works, FAO-UN*, WB experts*.

Argentina: Irrigation (2/3)

Social-Environmental Indicators (SEI)

- Beneficiaries*
- Direct Jobs*
- NBI: Unsatisfied Basic Needs*
- Environmental impact*
- Hydraulic stress*

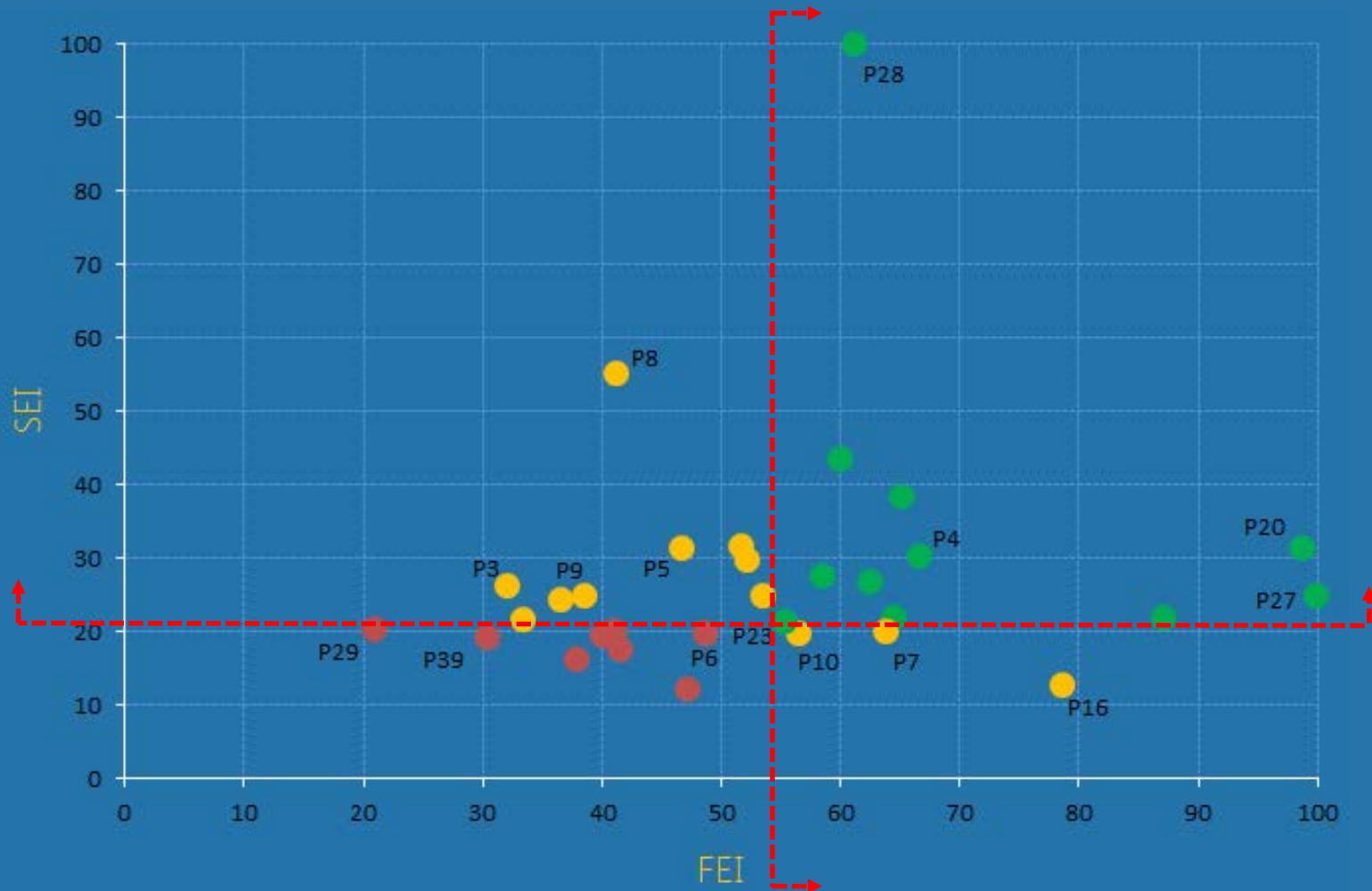
Financial-Economic Indicators (FEI)

- IRR*
- Implementation risks
 - Institutional factors*
 - Water supply*
 - Soil productivity*

Sensitivity analysis to compare results with other weighting methods

- PCA
- PCA with two constraints (2 scenarios)
- Simple average
- Subjective weighting (defined by FAO, MOP)

Argentina: Irrigation (3/3)



- Identification of potential PPPs from high priority projects

Sri Lanka: National Roads

- XX transport projects (national roads) pre-identified by the National Planning Department (NPD)*
- Existing multi-criteria approach to prioritization at NPD
- Discussion on existing criteria to prioritize investments

Social-Environmental Indicators (SEI)

- Beneficiaries*
- Jobs created*
- Resettlement*
- Environmental impact*
- Safety*
- Surface condition

Financial-Economic Indicators (FEI)

- Benefit-Cost ratio*
- Connectivity*

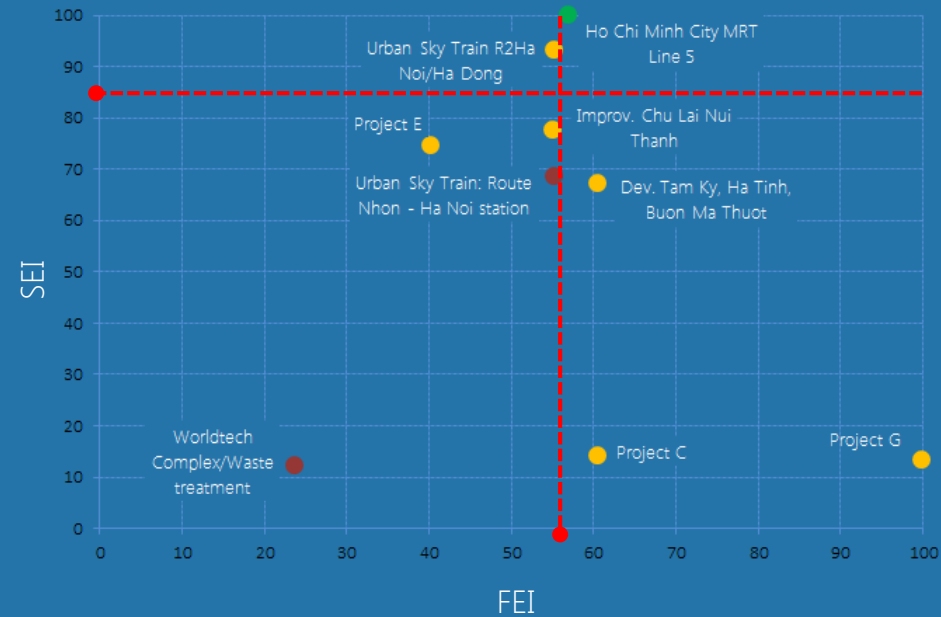
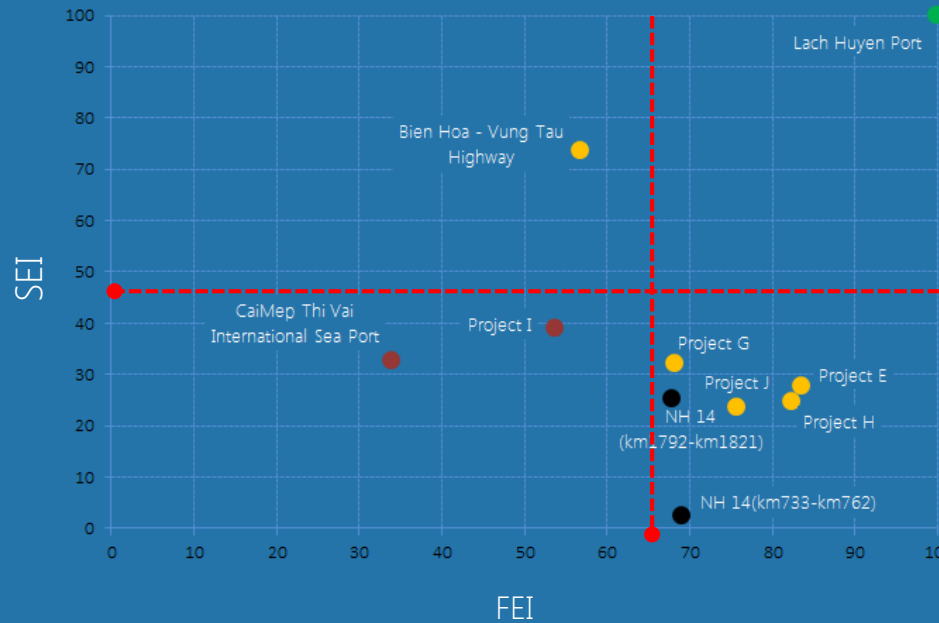
Vietnam: Sector Re-allocation



Transport



Urban



Rebalancing sectors toward high SEI urban projects would allow the government to reach 600,000 additional beneficiaries and create 1600 new jobs.



Next Steps and Conclusions



Next steps

- ✓ Conclude comparison with Chile prioritization system*
 - 2 Sectors; transport and water reservoirs
 - CBA is requirement for project to be eligible for funds (IRR > 6%)
- ✓ Prioritization of projects including infra-resilience indicators (Japan pilot)*
 - Initial discussions with Tokyo University*
- ✓ Platform to prioritize investments in Indonesia*



Conclusions

The IPF tool is a simple and practical system for objective prioritization of infrastructure projects.

- ✓ Allows for better use of public funds
- ✓ Combines social/environmental with financial/economic indicators
- ✓ Allows comparisons of projects within each sector
- ✓ Offers a mechanism for sector re-allocation
- ✓ Provides decision makers with a visual interface
- ✓ Improves data collection systems

Thank you