AFRICA ELECTRICITY SYMPOSIUM 2025

Innovative Blended Finance Structures for Large-Scale Hydropower in Frontier Markets: Evidence from Uganda

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Introduction

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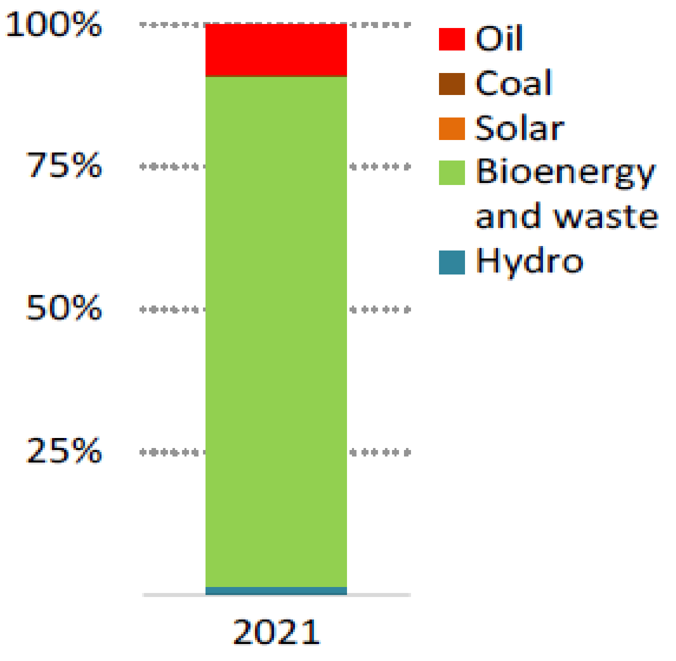
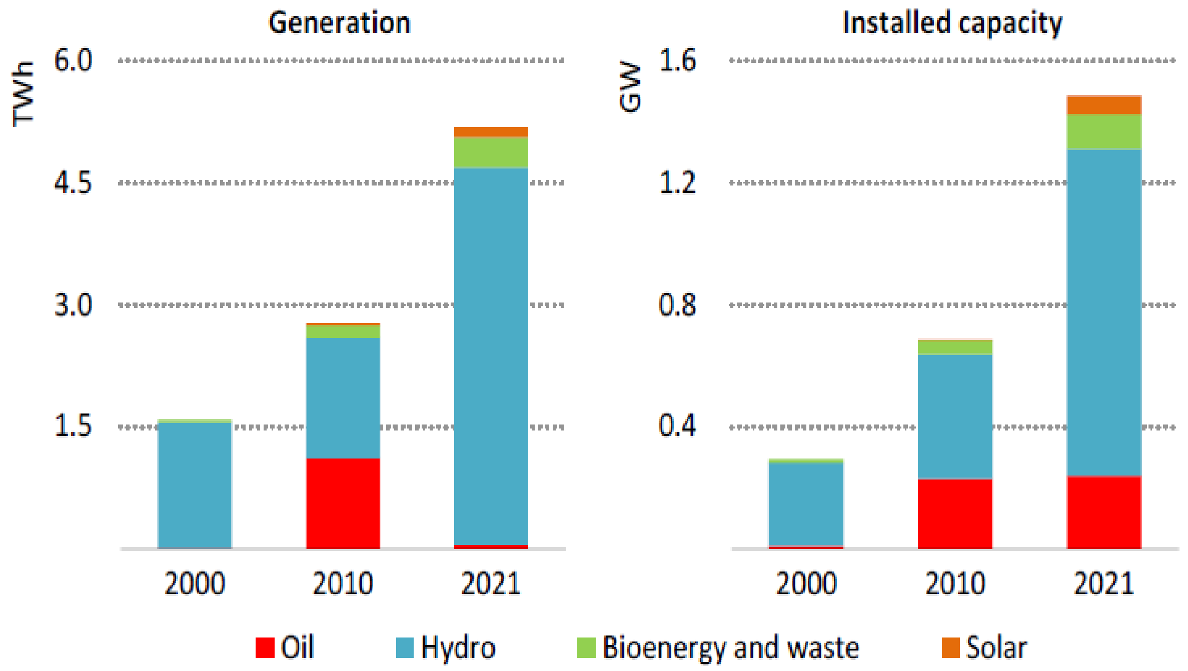
- Total Energy Supply, Power Generation & Installed Capacity in Uganda (2000-2021)





Source: Uganda Energy Transition Plan, MEMD & IEA

Problem

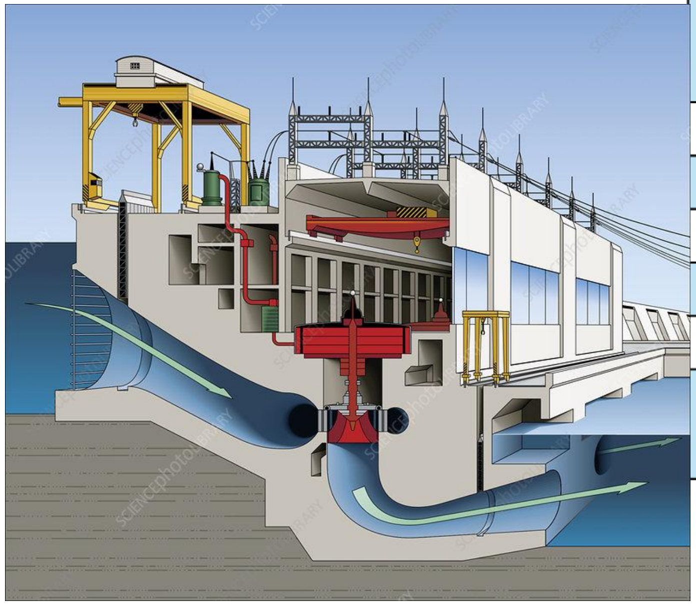
- Uganda's Energy Transition Challenge – 90% of energy from Biomass
- Vision 2040 Target – 52,000MW for Electricity
- Pipeline of Generation Projects – Oriang, Kiba, Ayago (over 1000MW)
- Concessional & Bilateral Financing is now LIMITED
- USD 23.66 Billion Total Debt &Limited Fiscal Space (Debt:GDP Ratio)
- Concentration Risk in Domestic Debt Market

Problem

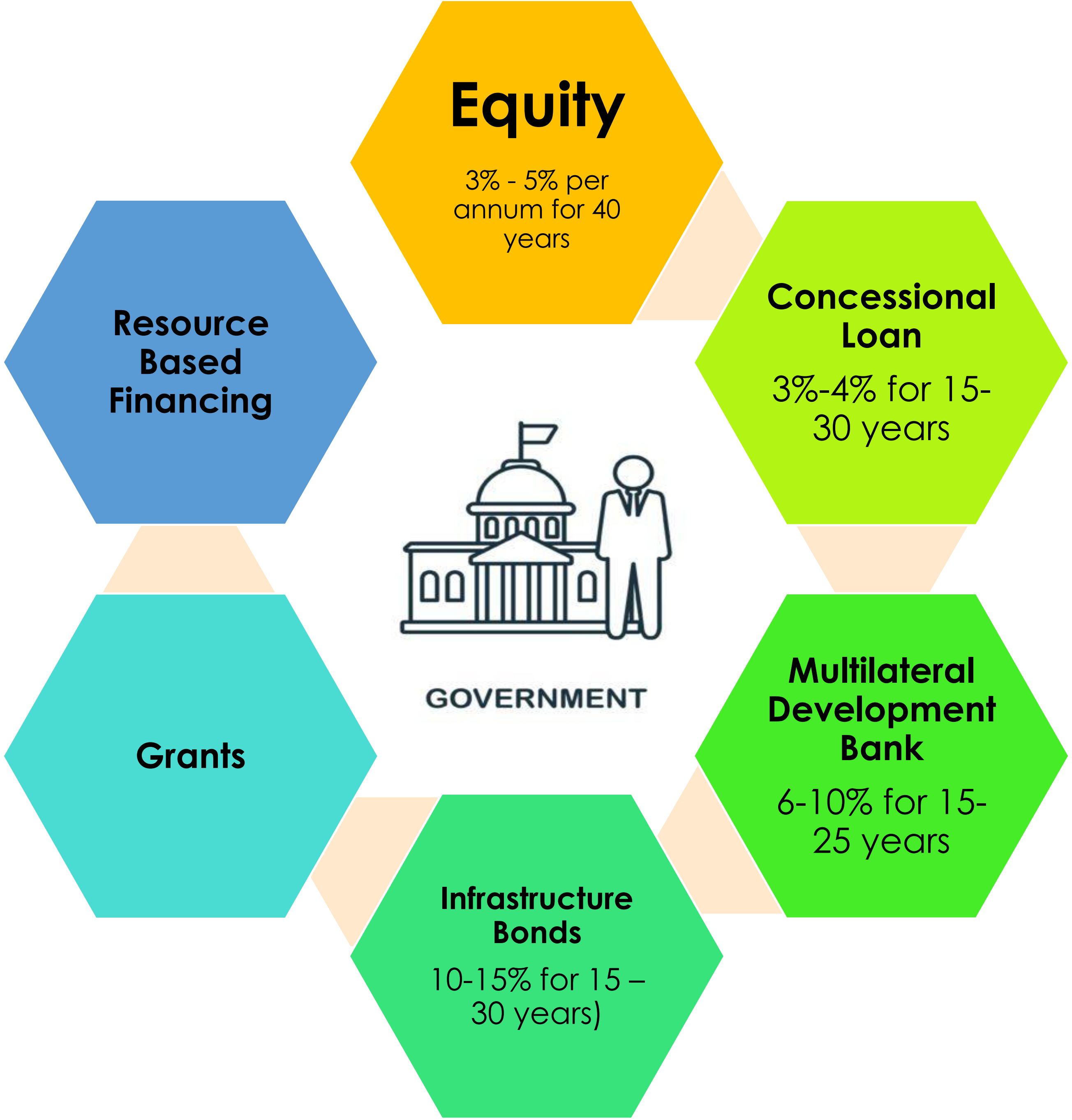
- Financing and Operational Mismatches
- Capital/ Debt Maturities Vs Hydro Asset Life
    - 15 Year Loan for an Asset with 50-100 years design life
- Debt Grace Period Vs Construction Period
- Debt Maturities Vs Generation License
- Implications on:
    - Project Costs
    - Financing Costs
    - LCOE & Tariffs
    - Financial Sustainability

Methodology

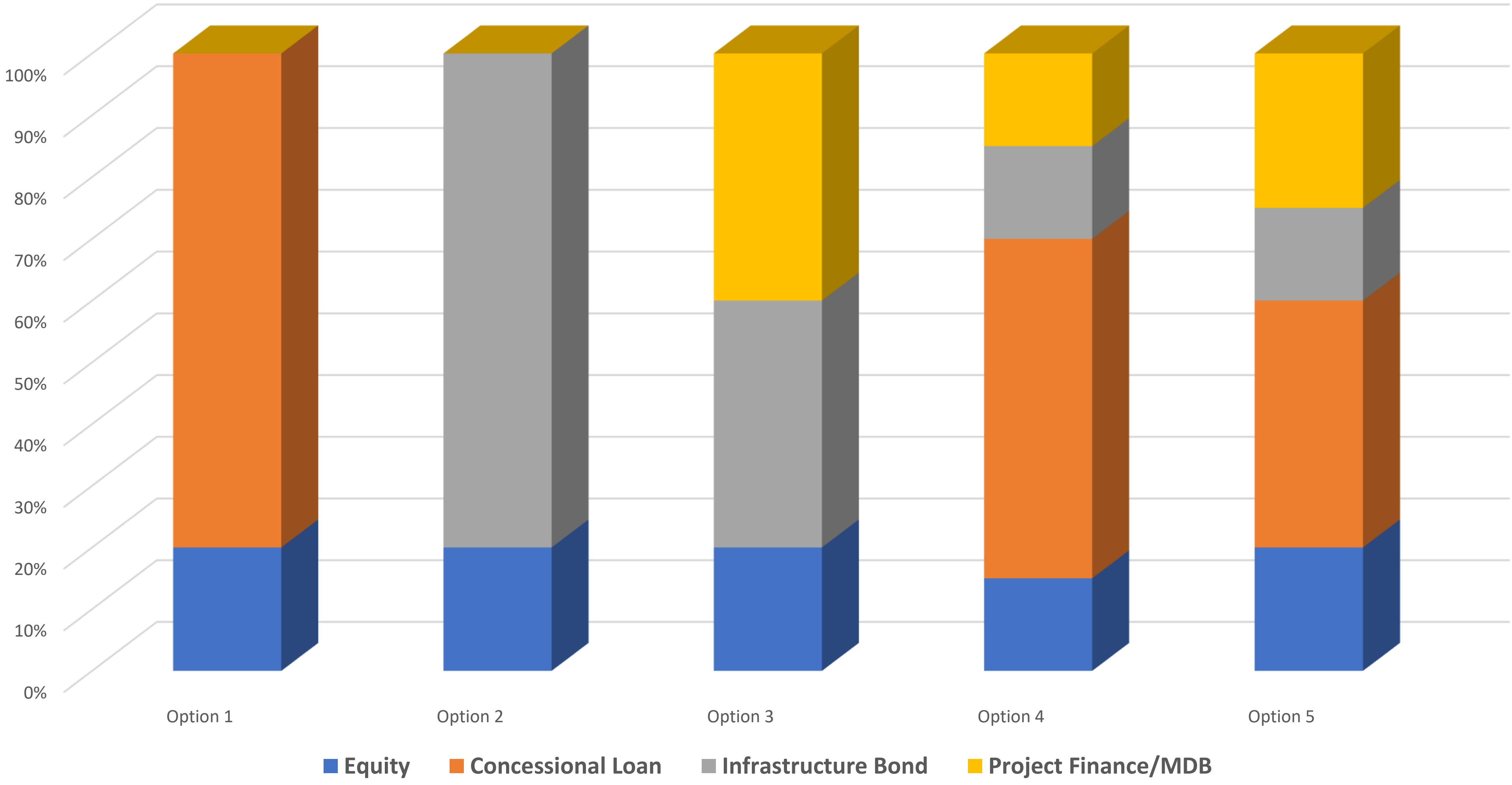
- Desktop Review
- Financing Modelling



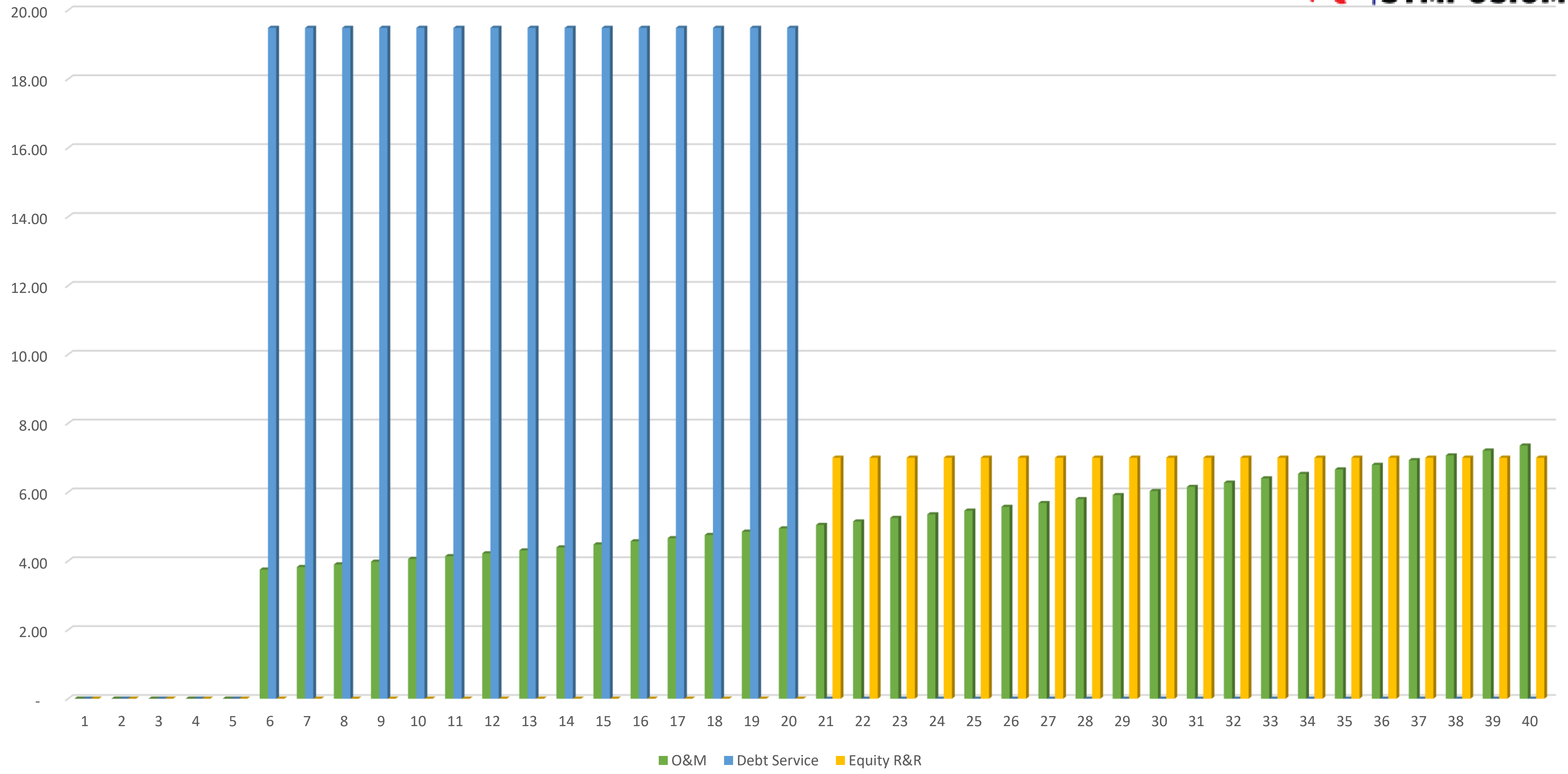
SNo	Technical Parameters	Units	Model Inputs
1	Plant Capacity	MW	100
2	Plant Factor	%	50% - 60%
3	CAPEX per MW	US $ Million	2.50
4	Total Capex	US $ Million	250
5	O&M Cost per Annum	%	1.5%
6	Annual Production	MWh	503,700
7	License Term	Years	40
8	Construction Period	Years	5
9	O&M Period	Years	35
10	Targeted LCOE per MWh	USD	50


Equity
3% - 5% per annum for 40 years
Concessional Loan
3%-4% for 15-30 years
Multilateral Development Bank
6-10% for 15-25 years
Infrastructure Bonds
10-15% for 15 – 30 years)
Grants
Resource Based Financing
GOVERNMENT

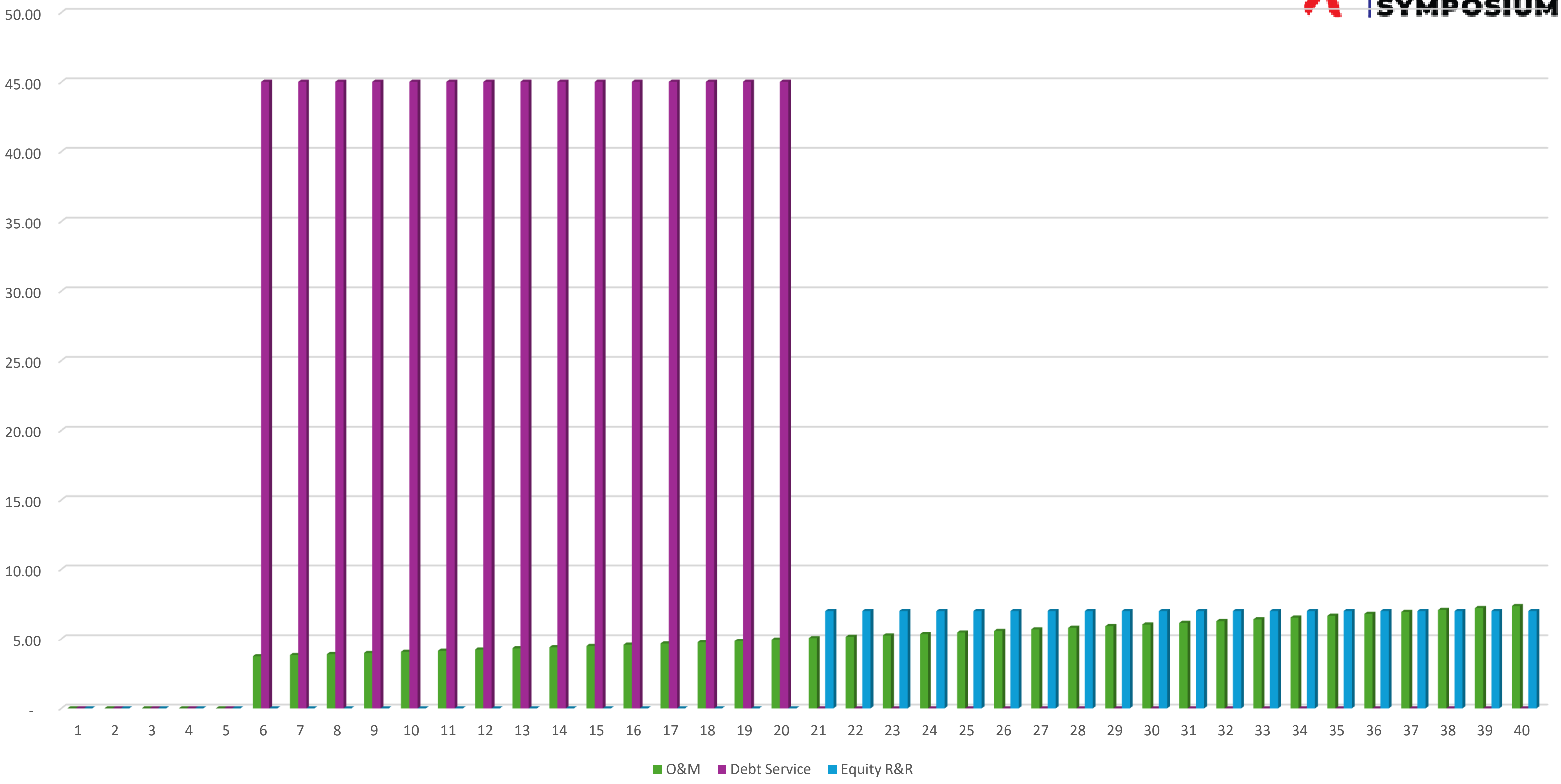
Financing Options for Large Hydro Power Projects



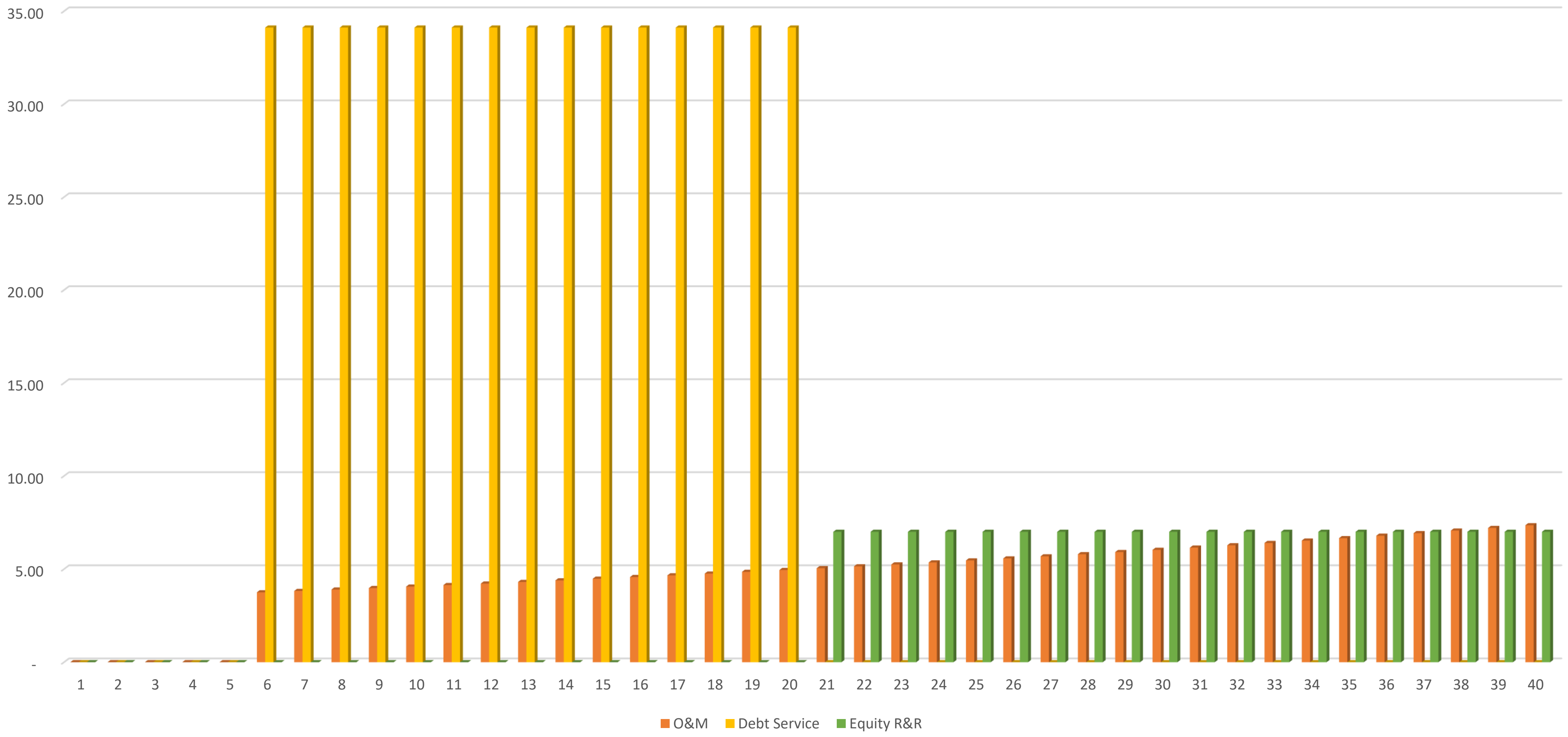
Concessional Debt,O&M and Equity R&R for a 100MW Plant, CAPEX USD 250m



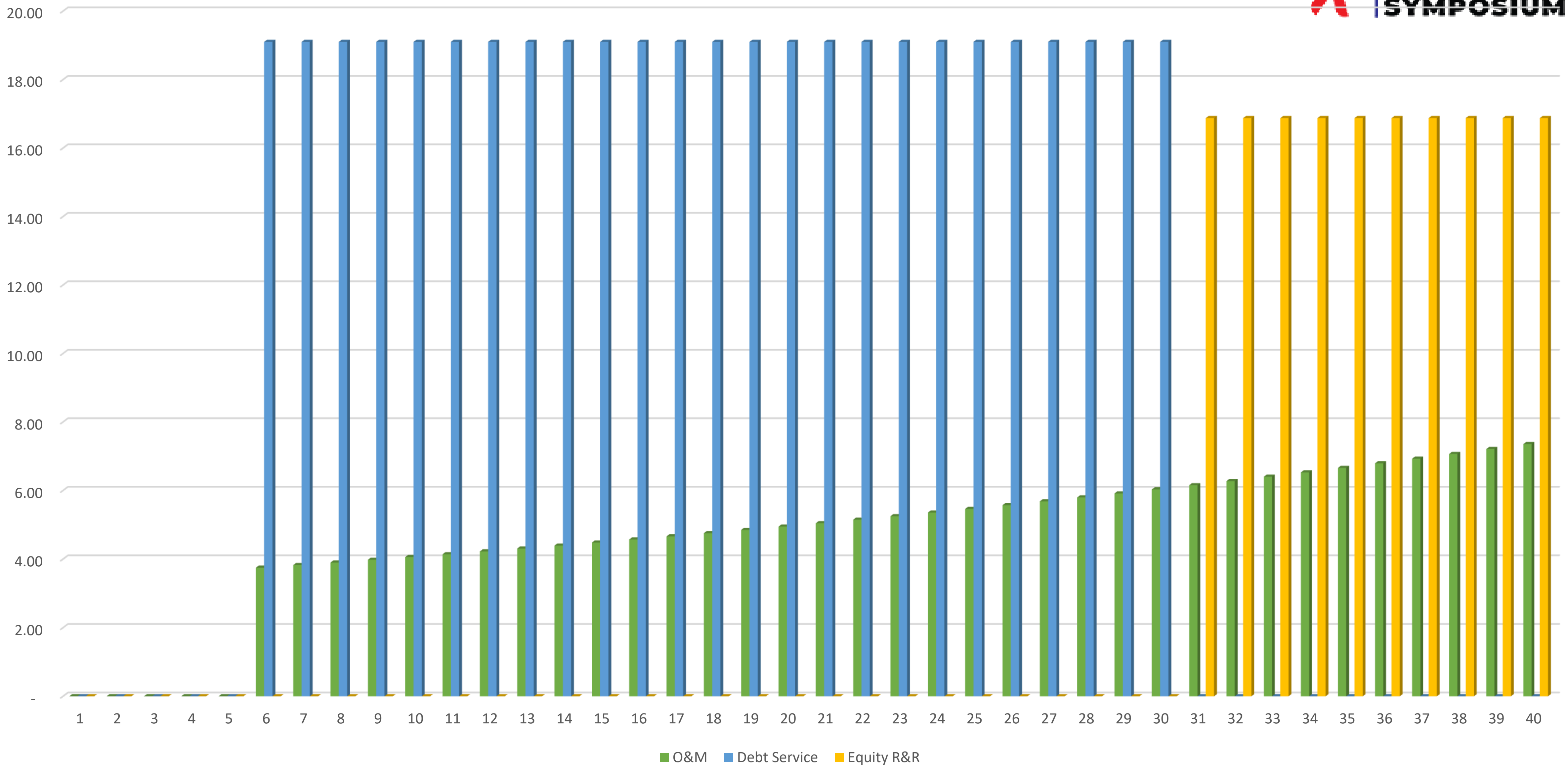
Infrastructure Bond Debt,O&M and Equity R&R - 100MW Plant, CAPEX USD 250m



Cash Requirements for Bond & MDB Debt,O&M and Equity R&R - 100MW Plant, CAPEX USD 250m



Blended Finance Debt,O&M and Equity R&R - 100MW Plant, CAPEX USD 250m



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Conclusions & Recommendations

- Pro-active policy shift to Blended Finance
- Risk Mitigation Tool
  - Demand Risk, Debt Payment Risk
- Project Management is still key!
  - Construction Delays and Cost Overruns affect LCOE
  - Phased Construction/ Commissioning
- Portfolio Modelling for Hydro Power Projects
- Negotiations on Large Hydropower Financing

References

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- Maximizing Finance for Development: World Bank on Nachtigal Hydro (Nicolas Sans and Patrice Caporossi)
- IEA 2021. Hydropower Special Market Report (Analysis and Forecast to 2030)
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Thank You!

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