A specialist energy consultancy

Integration and Investability of Renewable Energy in Islanded Grids

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Integration
Pacific Island Countries

Source: International Labour Organisation

Integration
Case Study 1

NETWORK CHARACTERISTICS

- 33kV, 22kV and 11kV
- 32 MW conventional generation
- 14.6 MW renewable generation
- 26 MW peak demand
- 13 MW minimum demand
- Interconnected network

GENERATION DISPATCH

- 11 diesel generators
- 15.4 MW output
- 11.8 MW output from renewables
- 24.1 MW Spinning Reserve – 88.9%

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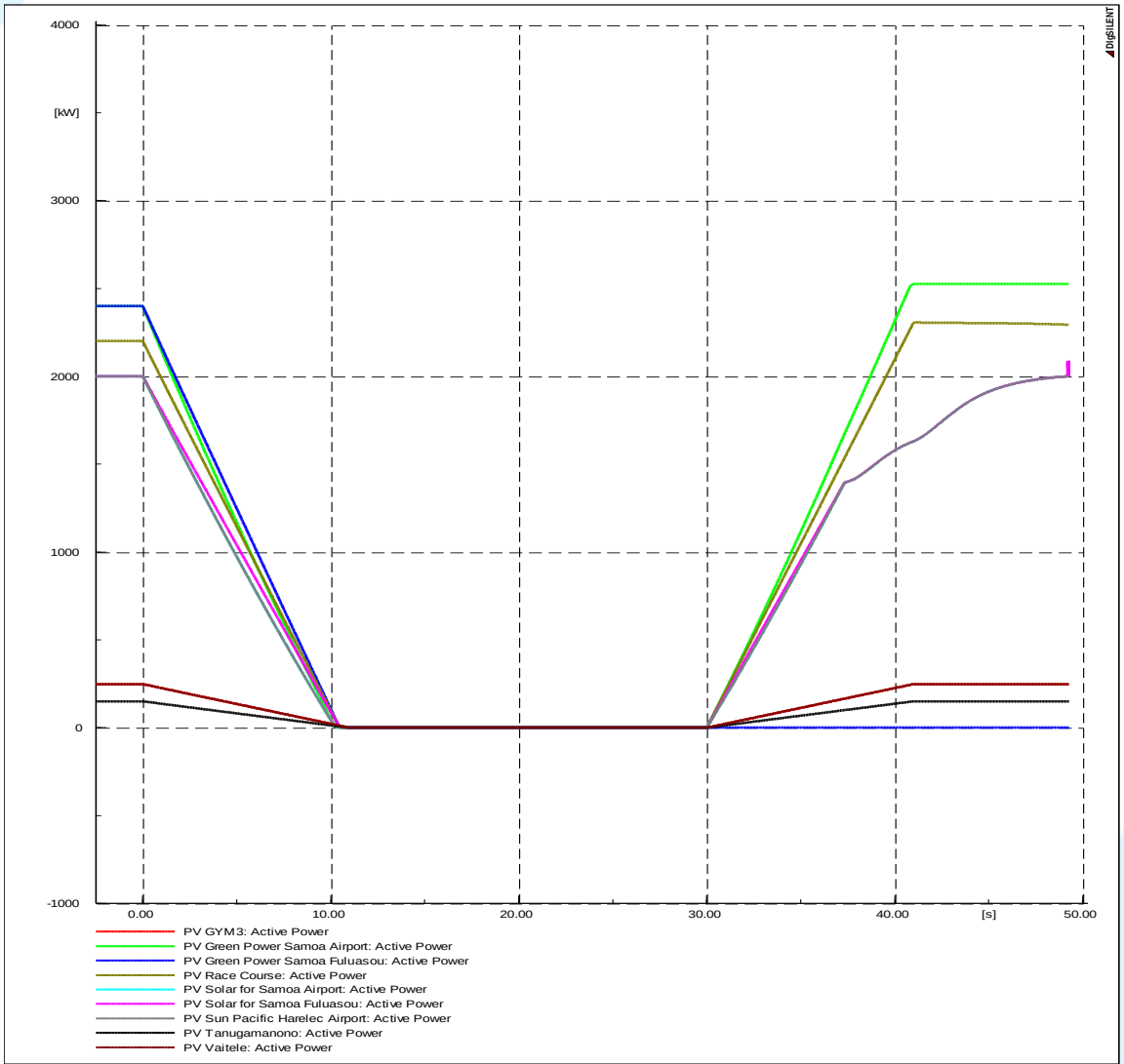
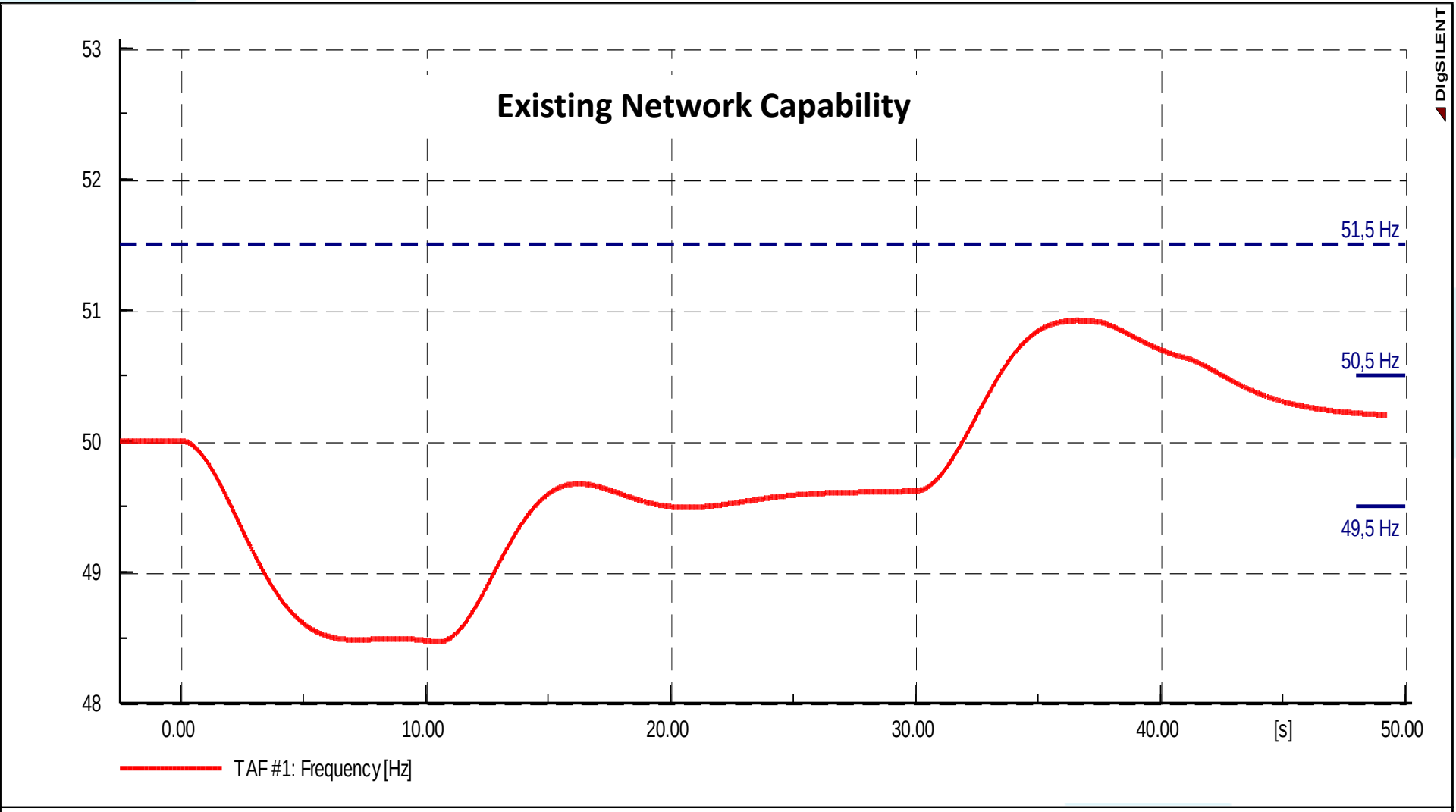
Integration

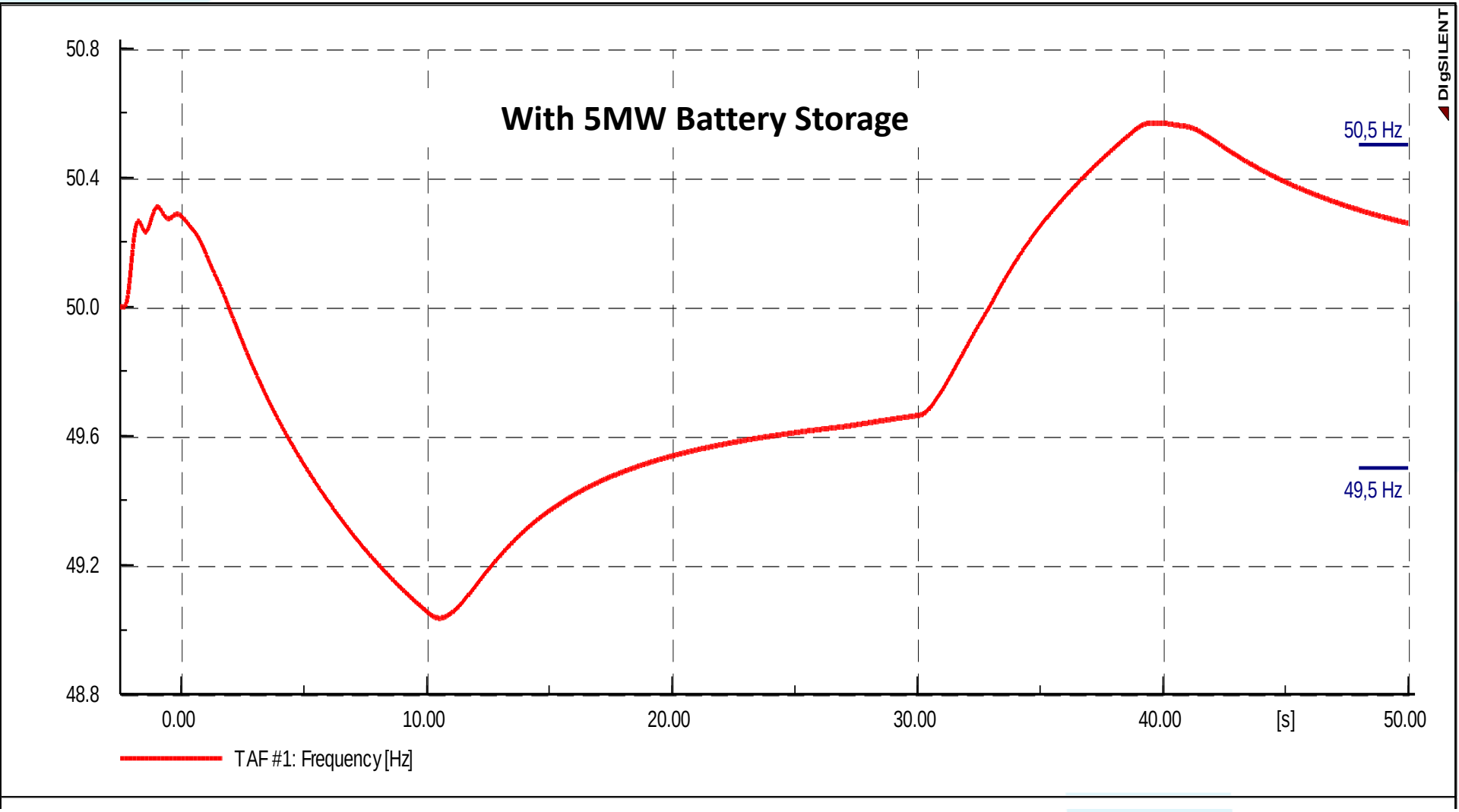
Case Study 1



Integration
Case Study 1



Integration
Case Study 1



Integration
Case Study 2

NETWORK CHARACTERISTICS

- 13.8 kV
- 9,700 kW conventional generation
- 265 kW renewable generation
- 3,000 kW peak demand
- 830 kW minimum demand
- Radial network

GENERATION DISPATCH

- 2 diesel generators
- 2,700 kW output
- 265 kW output from renewables
- 700 kW Spinning Reserve – 23.6%

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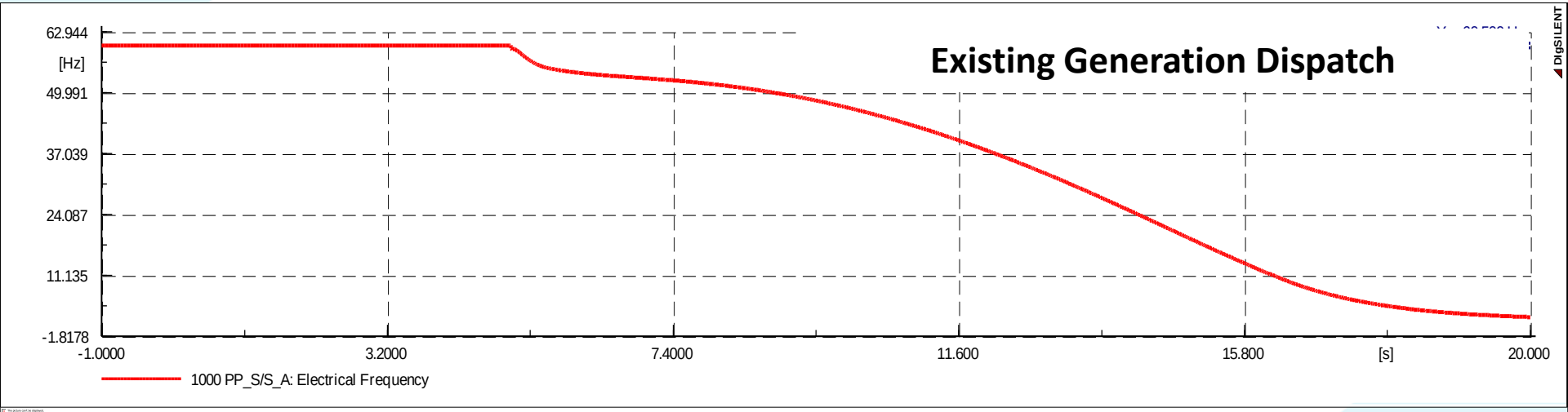
Integration
Case Study 2



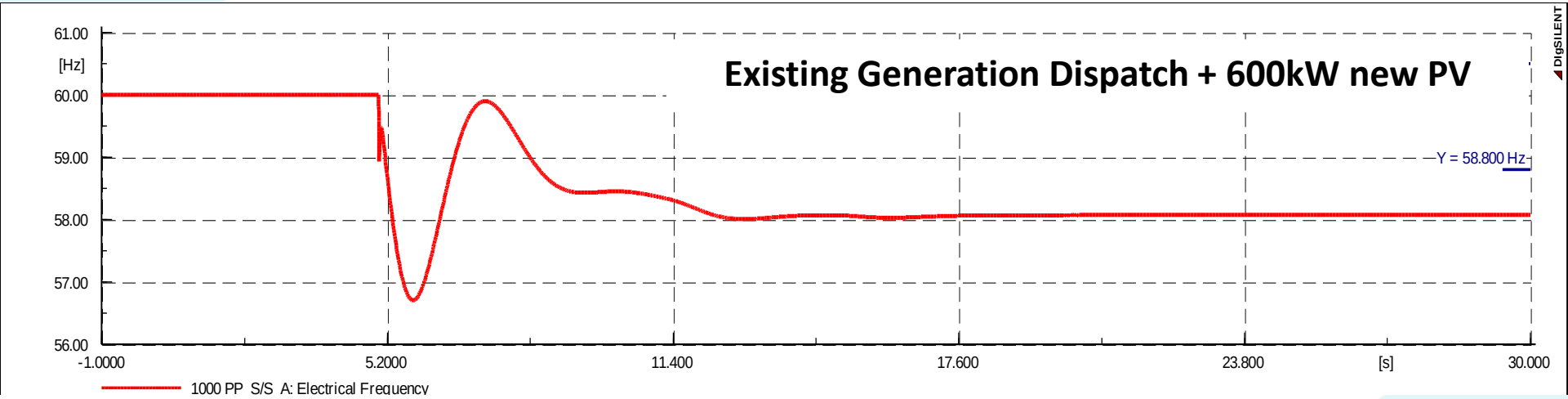
Revised Generation Dispatch

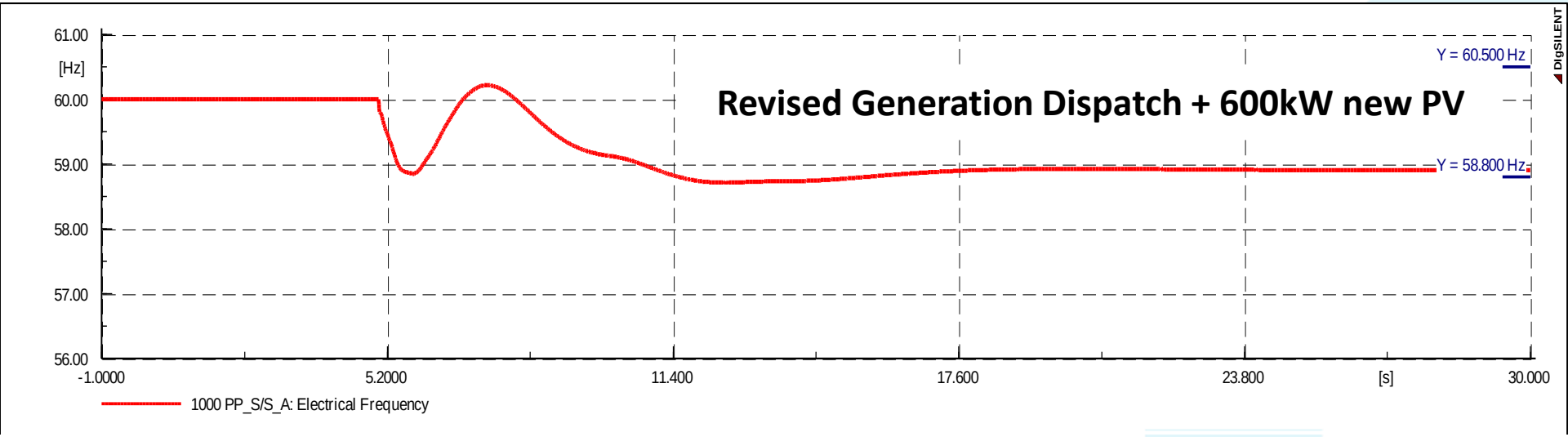
REVISED GENERATION DISPATCH

- 3 diesel generators
- 2,700 kW output
- 265 kW output from renewables
- 1985 kW Spinning Reserve – 66.9%

Integration

Case Study 2

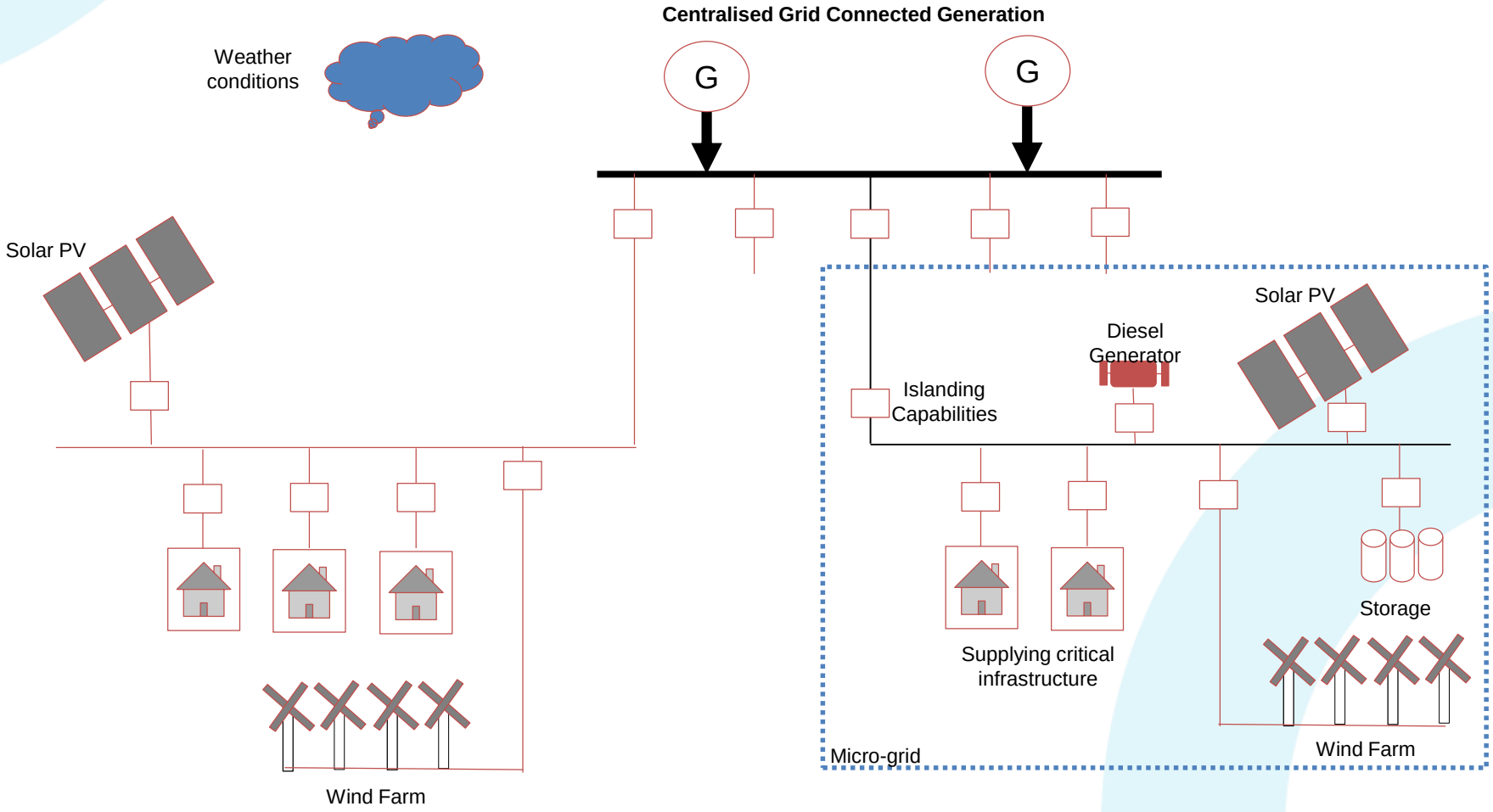




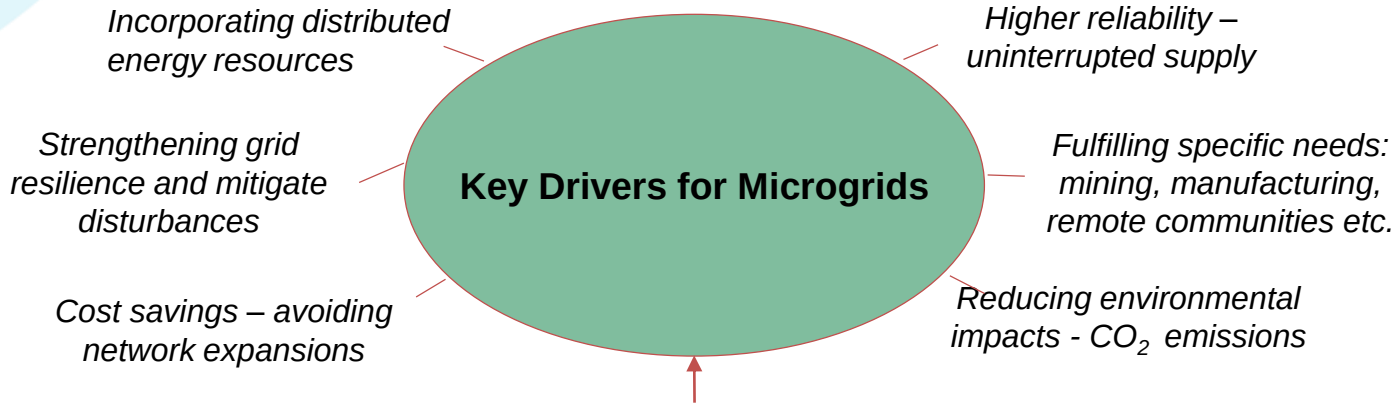
Integration

- Impacts of increasing renewables dependent on characteristics of the network
- The amount of spinning reserve is critical to maintaining stability
- Battery storage can improve frequency response
- Revising dispatch of conventional generation can also improve stability and frequency response

Microgrids & Islanding



Key Drivers



Generation is changing

- Distributed generation
- Increasing penetration of renewables

Storage options are becoming economical

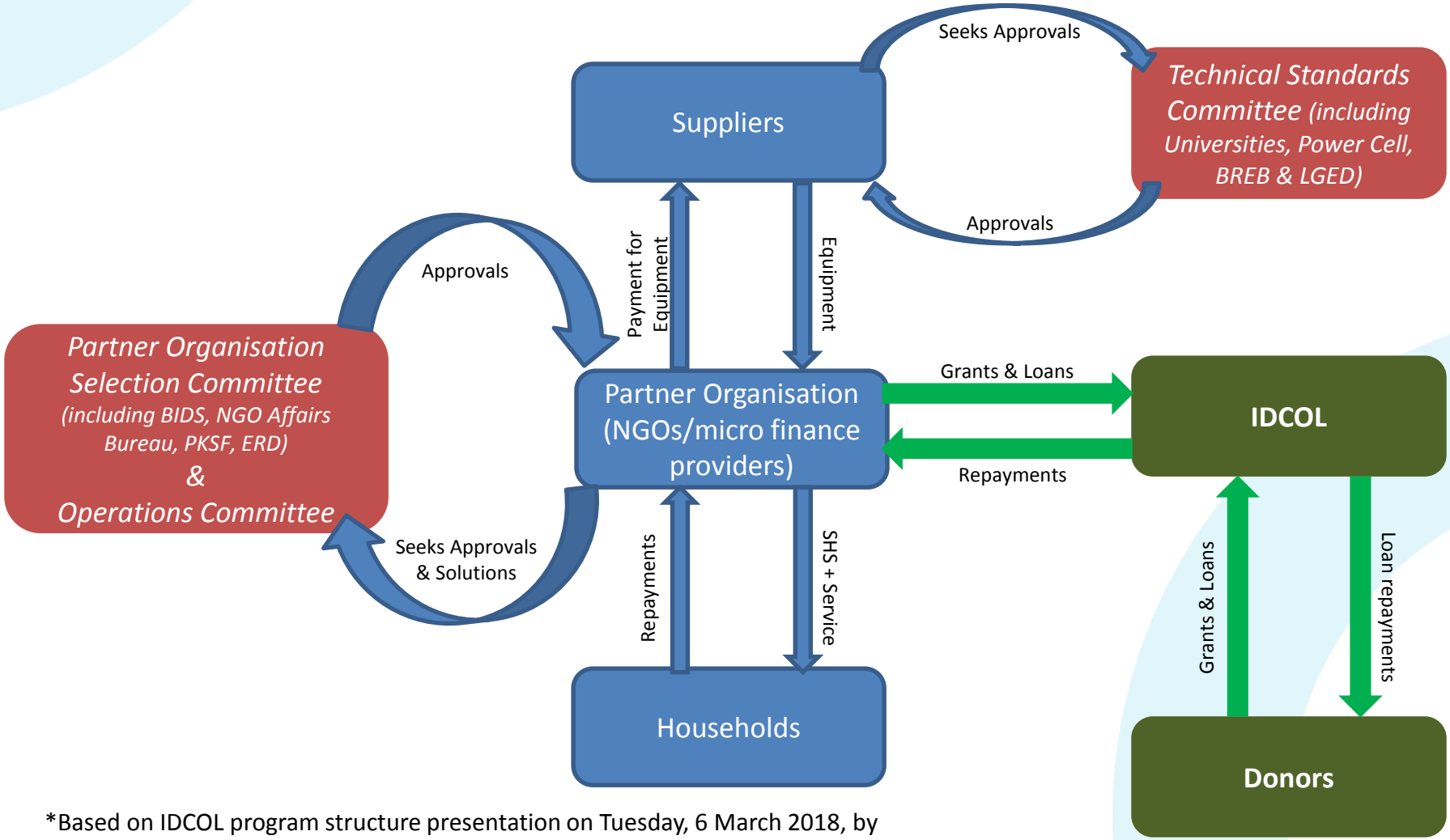
- Batteries
- Other storage such as power-to-x

More controlled distribution

- Improved asset management
- Controlled load, generation & power flows

Successful Business Models

The Case Study of Bangladesh (1)



*Based on IDCOL program structure presentation on Tuesday, 6 March 2018, by Junaed Tazdik & Mafruda Rahman

Successful Business Models

The Case Study of Bangladesh (2)