The Otjikoto Biomass Power Station:

Fuel Supply Strategy and Information Sharing Session

Dr. Grant Muller & Mr. Gordon Gadney | 14 August 2019

***Disclaimer**: As the project develops, the information contained in this presentation is subject to change without notice.*

Otjikoto Biomass Power Station

Welcome and Opening Remarks

Sign Attendance Register

Presentation Part 1: (09h00 -10h30)

- Overview of Otjikoto Biomass Power Station Project
- Biomass Fuel Supply Strategy

Tea/Coffee Break: (10h30 - 10h50)

Presentation Part 2: (10h50 - 12h15)

- Biomass Fuel Supply Strategy (cont.)
- Fuel Supply Contracting Considerations

Discussion and Questions: (12h15 - 13h00)

- Questions on the presentation
- Feedback from stakeholders
- Way-forward

Presentation Overview

Welcoming & Introduction

Otjikoto Biomass Power Station

1. Introduction
2. Background and Benefits
3. Project Technical Description
4. Biomass resource and encroacher bush
5. EIA Process and Overview
6. Project Execution Philosophy
7. Project Progress to Date

Biomass Fuel Supply Strategy

8. Harvesting and Fuel Requirements
9. Monthly Fuel & Storage
10. Fuel Specification
11. Fuel Supply Process
12. Environmental Considerations
13. Proposed Fuel Supply Philosophy
14. Fuel Supply Options
15. Fuel Supplier Procurement Philosophies

Fuel Supply Contracting

15. Contracting Chain
16. Supply Chain Monitoring and Audit
17. Harvesting Agreement
18. Site Specific Harvesting Plan
19. FSA Term Sheet

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Overview of Otjikoto Biomass Power Station Project

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Otjikoto Biomass Power Station

Introduction

Objectives of the Information Sharing Session:

- Share information on the Otjikoto Biomass Power Project with the Public, with potential future Harvesters and with interested and affected parties.
- Provide opportunity for Stakeholders to give input and comments on the Project.
- However please bear in mind that this is not intended to be a forum to discuss the feasibility of the Project.
- The Project is in its establishment phase and still has several hurdles to cross such as the Generation License, EIA Public Participation Meeting as well as the Final Investment Decision by NamPower Governance Structures.
- We would like to request that if there are any matters/concerns, that are not raised in the meeting to please forward them to the Project Team.

Benefits for attending the Information Sharing Session:

- Understand the Biomass Power Station Project and its status.
- Provide an overview of the Fuel Supply Strategy.
- Highlight potential areas of involvement within the Fuel Supply Chain

Open discussion platform at the end of each session

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Otjikoto Biomass Power Station

Background & Benefits

NamPower Corporate and Strategic Business Plan for the period 2019-2023

Minister of MME determination of 150 MW allocation to NamPower

Fifth National Development Plan (NDP5) 2017/18-2021/22

National Integrated Resource Plan (NIRP 2016)

Benefits of Fuel Supply Chain

- Increases direct, indirect and induced job creation
- Improves livestock carrying capacities through increase rangelands
- Increases groundwater potential
- Displaces of greenhouse gas emissions

Benefits of Otjikoto Biomass Power Station

- Provides a dispatchable baseload generation option
- Enhances security of supply to customers
- Promotes and stimulates the biomass fuel supply chain in Namibia
- Provides a proven concept for future project duplication across Namibia

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Otjikoto Biomass Power Station

Project Technical Description

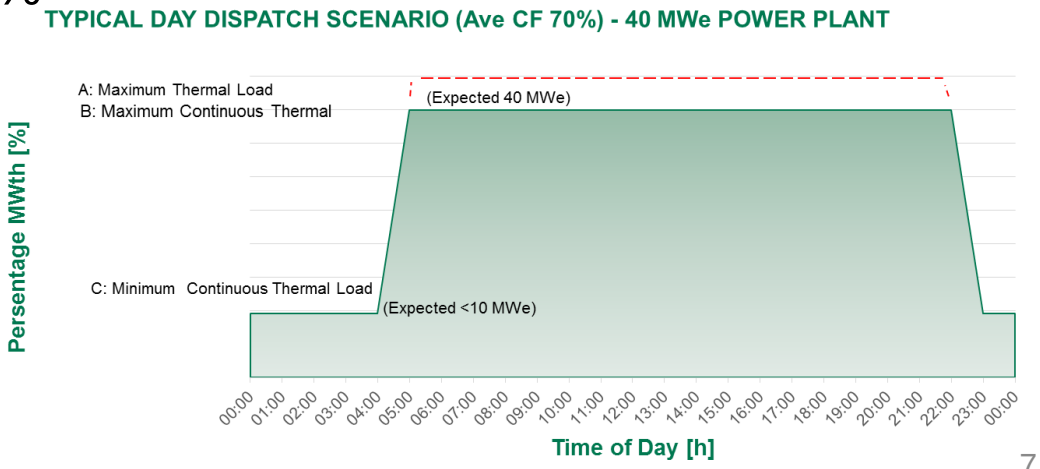
Technical:

- Size: 40 MWe or 2 x 20 MWe
- Site area: ±44 ha
- Preferred Grate fired boiler technology
- Fuel: Encroacher Bush Biomass Wood Chips (P100 Norm)
- Availability: 85~92%
- Capacity factor (CF): 60~70%
- Lifetime: 25 years

(Project Site)

General:

- COD: 2023
- NamPower owned land



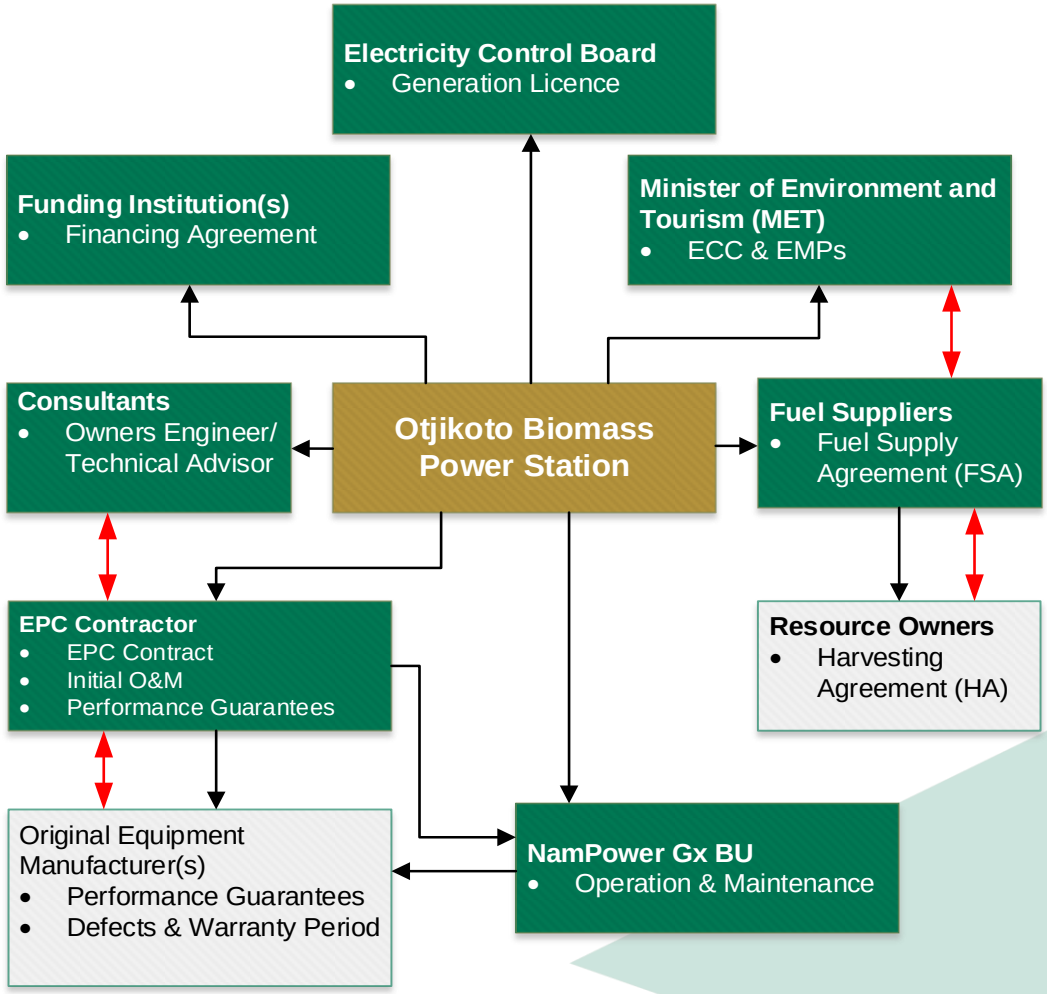
Otjikoto Biomass Power Station

Project Execution Philosophy

Key Execution Agreements

- Construction:
  - EPC Contractor
  - Owners Engineer
- Fuel Supply Agreements
- Harvesting Agreements

Financed, Owned, and operated by NamPower



Otjikoto Biomass Power Station

EIA Process and Overview

Scoping Phase [May 2015]

- 6 Sites

Scoping Report approved [May 2016]

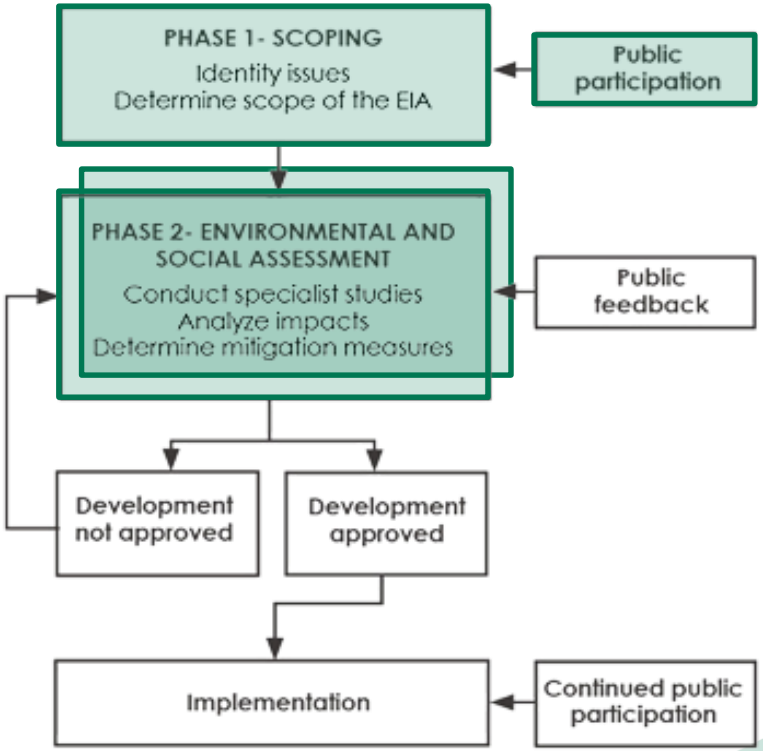
NamPower applying for 2x ECCs:

- Construction and Operation of the Power Station
- Related Harvesting Activities

All Specialist studies completed

Funding Institution's considerations

- IFC and Equator Principles
- Possible FSC Principles
- Aftercare Considerations

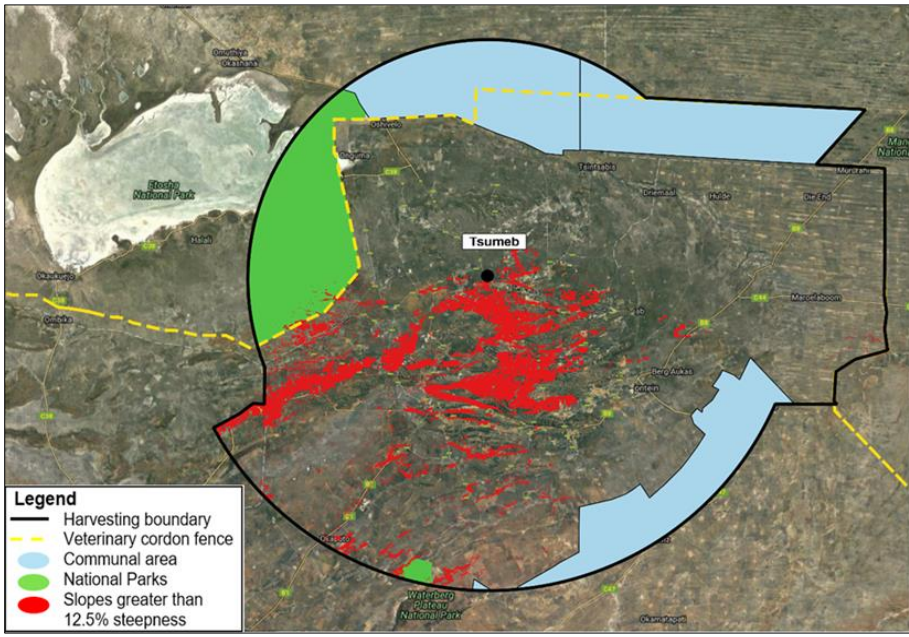


Otjikoto Biomass Power Station

Biomass resource and encroacher bush

Quantity

- Harvestable Area: 3.1 mil ha
  (excl. slopes &protected areas)
- Extractable Yield: 12.65 t/ha
- Resource Available: ±40 mil tonnes
- 12.8% of the Harvestable Area will be harvested over 25-years (excl. regrowth)



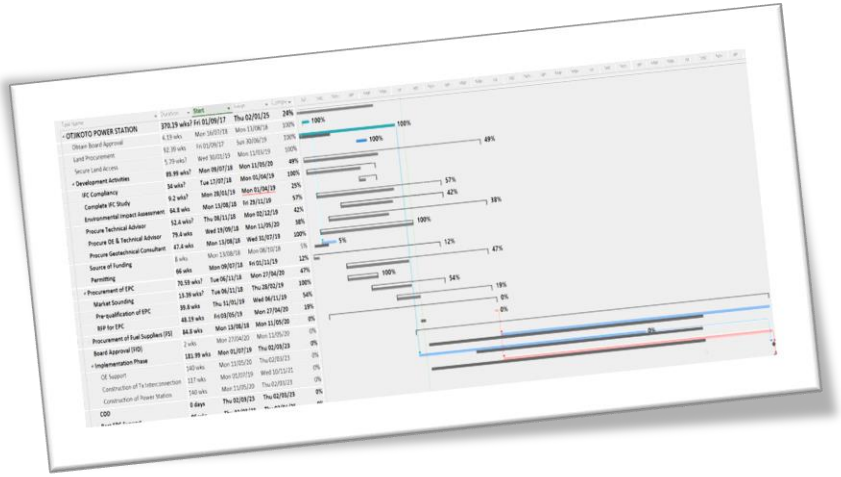
(EIA Scoping Report , 2016)

Quality

- Slightly higher chlorine content
- Significant higher silica content
- Substantially lower moisture content
- 14.7 MJ/kg (15% Moisture Content & 5% Ash Content)
- Specification based on EU Norm (EN ISO 17225-1)

Otjikoto Biomass Power Station

Project Progress to Date



- Board Approval obtained
- Market Sounding completed
- Project Site procured
- EIA specialist studies completed
- First IFC Audit on EIA completed
- Geotechnical studies completed
- Technical Advisor procured and EPC technical specification underway
- Owner's Engineer procurement process commenced with the CPBN in Aug 2018
  - Expression of Interest
  - Request for Proposal
- EPC procurement process commenced with the CPBN in July 2019
  - Prequalification
  - Two envelope Bidding Process
- Fuel Supply Strategy and Fuel Supply Agreement development underway

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Biomass Fuel Supply Strategy

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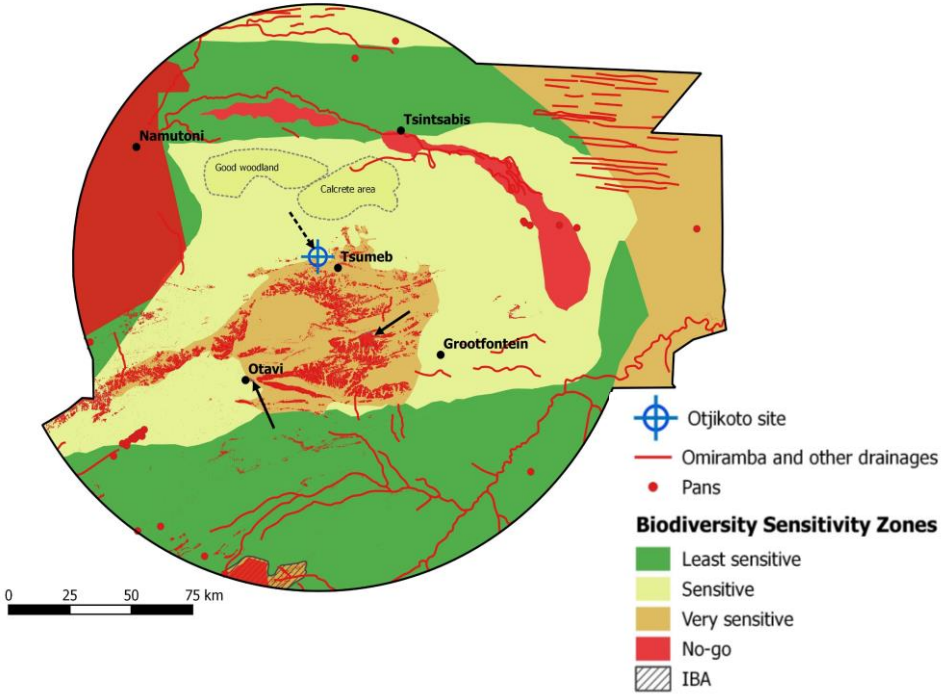
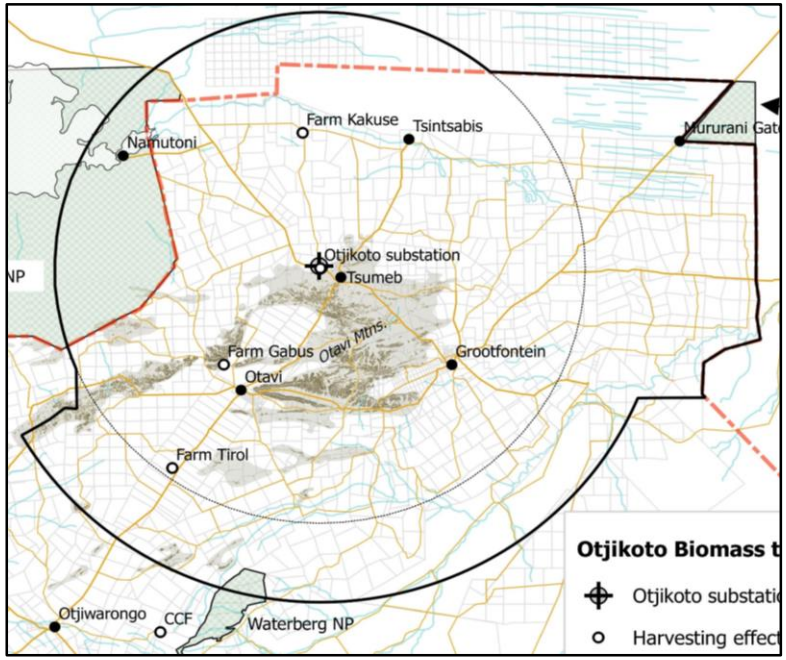
Biomass Fuel Supply Strategy

Annual Fuel and Area Requirements

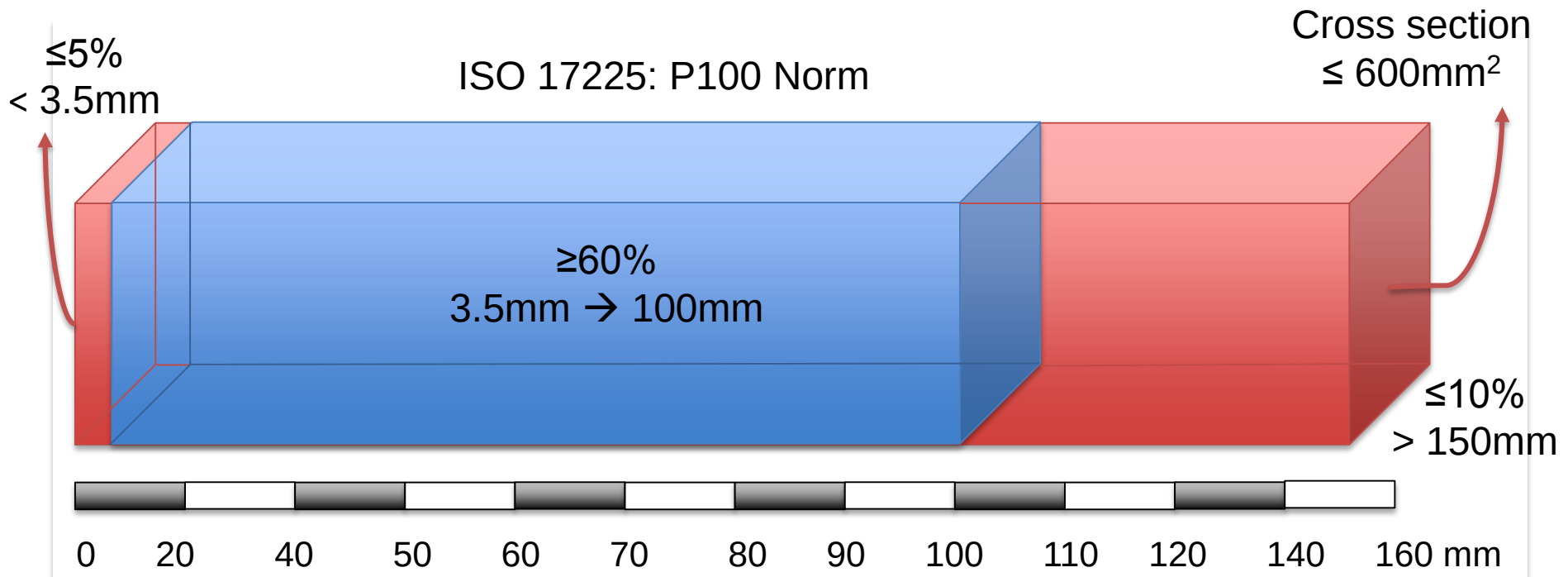




Key assumptions	Unit	Capacity factors		
		±60%	±70%	±85%
Annual fuel requirement	**tonnes/a**	**175,000**	**204,000**	**245,000**
Area required per annum	ha	14,583	17,000	20,417

Biomass Fuel Supply Strategy

Fuel Specification



Max length ≤ 350mm

Hog Fuel:
crushed or shredded
with blunt tools

Wood Chips:
cut with sharp tools

Biomass Fuel Supply Strategy

Fuel Supply Process Overview

Resource Identification

Within Harvesting Area
Suitable resource
Adequate infrastructure
Meet EIA and EMP

Harvesting Agreement

Access to resource
Site Establishment
Meet EIA and EMP

Site Specific Harvesting Map

Indicate: Buffer, Sensitive, No-go, harvesting areas
Access road use
Tree Equivalent counts

Selective Harvesting

Bulldozer
Bush Roller
Shearing
Semi-manual
Etc.

Windrows (Drying heaps)

Bulldozer
Bush Rakes
Grappling hooks
Etc.

Chipping/ Processing

Chipping to specification
P100 Norm
0.25 tonnes/m^3
15~40 tonnes/h

Infield storage/ transport

Monitored and Audited





Biomass Fuel Supply Strategy

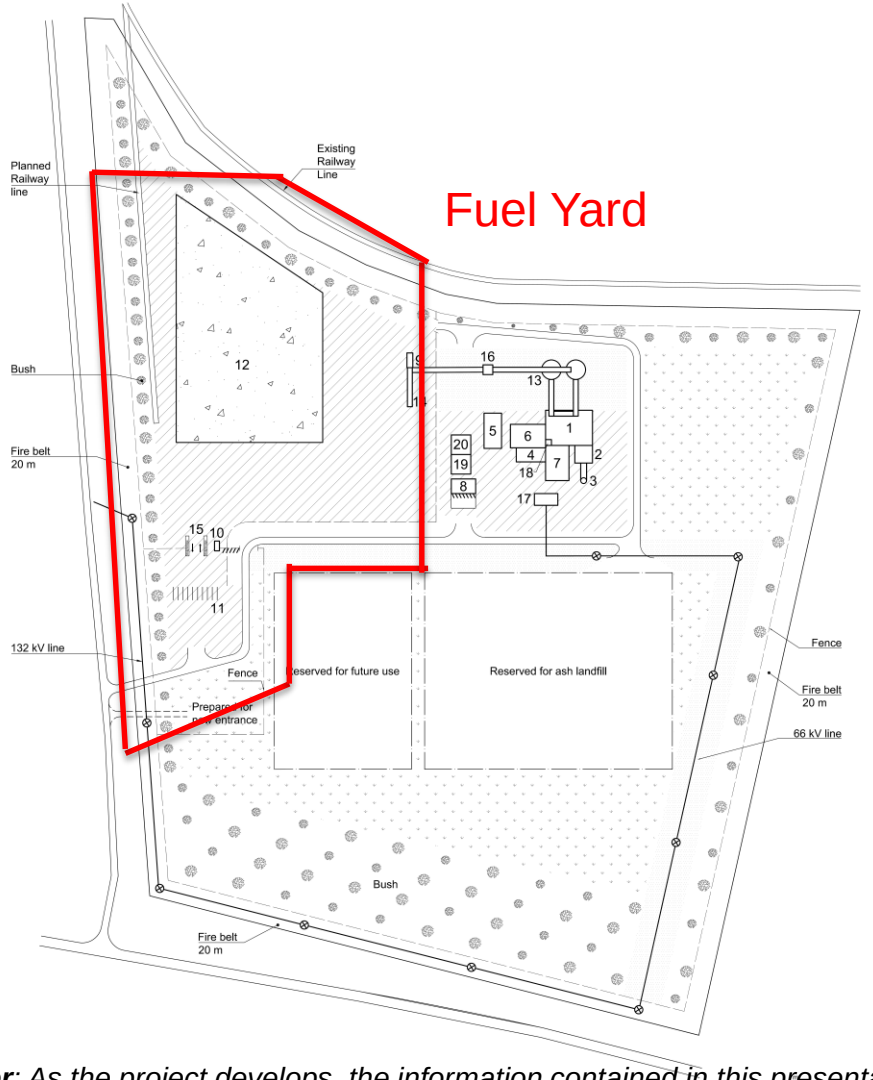
Fuel Supply Process Overview

Quality Assurance

Transport to Site	Queueing/ Arrival on Site	Acceptance of Fuel	Offloading at Delivery Point
≤ 100 tonnes	07h30 ~ 16h30	Visual Inspection	Fuel Delivery Bunker
Road worthy	10 Parking spaces	Weighing of consignment	Side-tipping
0,25 tonnes/m3	Sequential processing	Sampling of Fuel	Back-tipping
≤ 100 km	2x Weighbridges	Detailed inspection	Open Storage Area (demarked and partitioned)

Otjikoto Biomass Power Station

Fuel Supply: Proposed Power Station Layout



No	Description
1	Boiler Hall
2	Flue Gas Cleaning
3	ID-Fan, ducts, stack
4	Turbine Hall
5	Air Cooled Condenser
6	Auxiliaries hall
7	11 kV switch room
8	Administration Building
9	Wood Chipper
10	Security and access control building
11	Parking Lots
12	Open Storage Area (90 Days)
13	Enclosed Storage Area
14	Fuel Receiving Bunker
15	Weighbridge and Laboratory
16	Screening Area
17	Substation
18	Main Control Room
19	Workshop and storage
20	Garage

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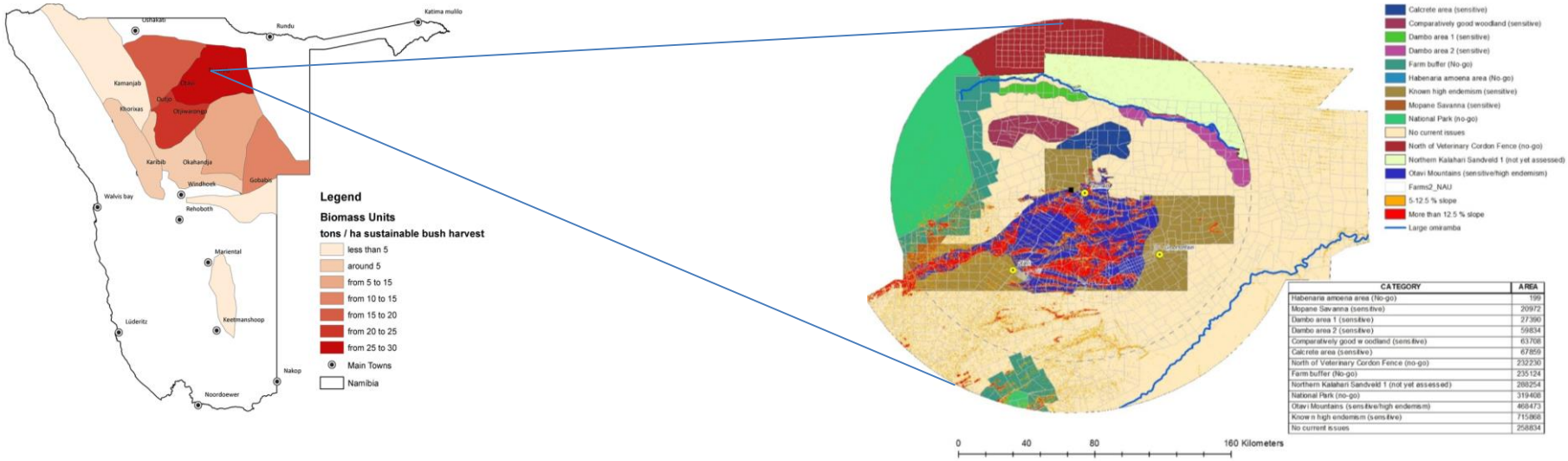
Biomass Fuel Supply Strategy
Environmental Considerations

Harvesting and Transport EMP

- General Management Plan
- Biodiversity Management Plan
- Soil Management Plan
- Groundwater Management Plan
- Surface water Management Plan
- Archaeological Management Plan
- Noise Management Plan
- Traffic Management Plan
- Air Quality Management Plan
- Health and Safety Management Plan
- Visual Management Plan
- Socio-Economic Management Plan

Biomass Fuel Supply Strategy

Fuel Supply: Proposed Philosophy



CATEGORY	AREA
Habenaria amoena area (No-go)	199
Mopane Savanna (sensitive)	20972
Dambo area 1 (sensitive)	27390
Dambo area 2 (sensitive)	59834
Comparatively good w oodland (sensitive)	63708
Calcrete area (sensitive)	67859
North of Veterinary Cordon Fence (no-go)	232230
Farm buffer (No-go)	235124
Northern Kalahari Sandveld 1 (not yet assessed)	288254
National Park (no-go)	319408
Otavi Mountains (sensitive/high endemism)	468473
Known high endemism (sensitive)	715868
No current issues	258834

Long Term Fuel Suppliers

- Provide the bulk of the Fuel (Large volume allocations)
- Expected to take up performance obligations
- Significant investment requirements
- Bankable Fuel Supply Agreement
- Regulated Harvesting Agreement

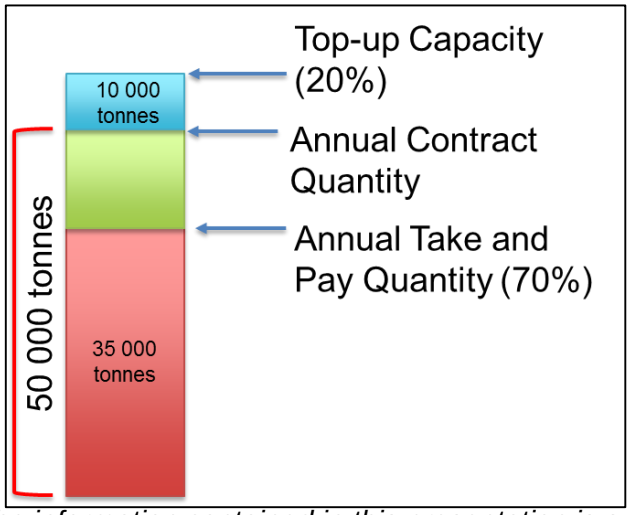
Ad Hoc Fuel Suppliers

- Opportunity to participate in the Fuel Supply Chain
- Minimum truck load/size
- Regulated volume thresholds
- Simplified Fuel Supply Agreement
- Adherence to the EIA & EMP

Biomass Fuel Supply Strategy

Long Term Fuel Suppliers

- Provide the bulk of the Fuel to the Power Station and essentially secure the minimum Fuel quantities required to operate the Otjikoto Biomass Power Station;
- Expected to take up the performance obligation of ensuring a reliable supply to the Power Station;
- Liable for liquidated damages for non-delivery or non-performance;
- Will incur significant financial cost to ramp up and invest into the necessary harvesting equipment.



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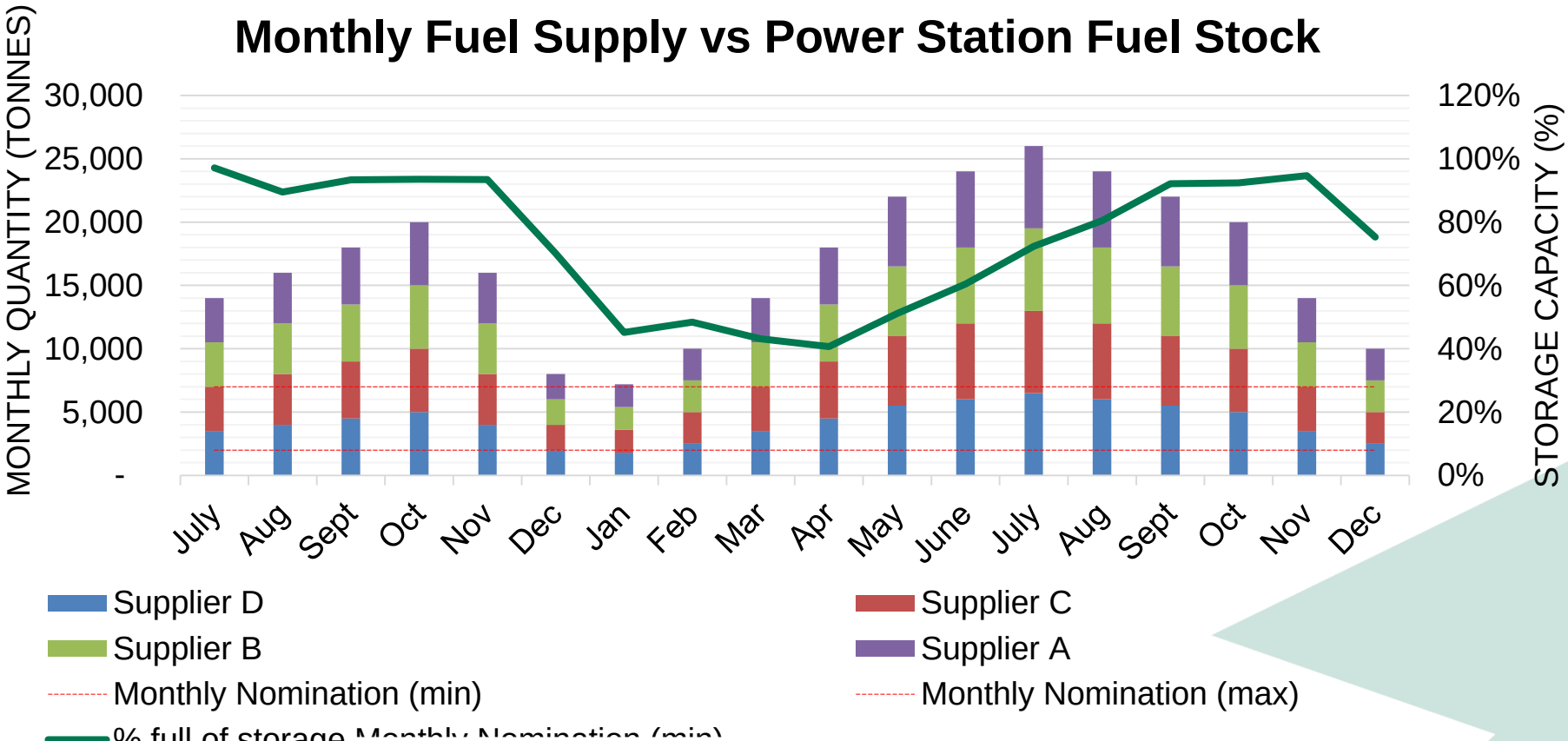
Biomass Fuel Supply Strategy

Monthly Fuel and Storage - Model

- At least 4 *Long Term Fuel Suppliers* to maintain the economies of scale; and
- At least 30,000 tonnes can be supplied by *Ad Hoc Fuel Suppliers.*
- The need to maintain a 3 month on-site fuel stockpile (Open Storage Area)



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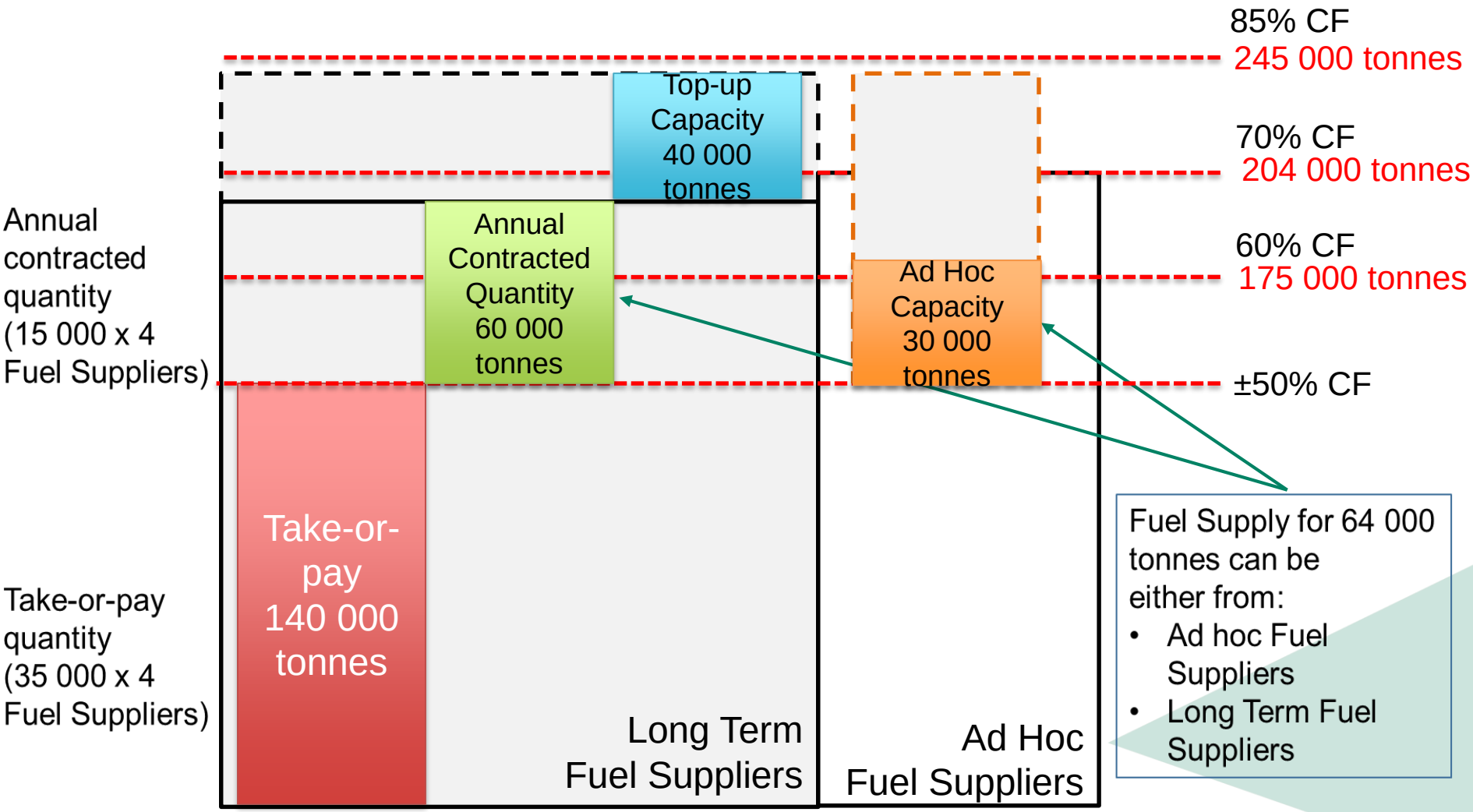
Biomass Fuel Supply Strategy

Overall Fuel Requirements from Suppliers



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Biomass Fuel Supply Strategy

Ad Hoc Fuel Suppliers

- Opportunity to participate within the Biomass Fuel Supply Chain;
- Provide a minimum truck load/size of 8 tonnes;
- NamPower shall provide for an On-site Chipper;
- Regulated and impose volume threshold(s);
- Need to comply to a “watered-down” version of the NamPower EMP;
- A simplified Fuel Supply Agreement for planning, management and control purposes;
- The simplified FSA will assist in obtaining financial aid to invest into harvesting equipment.

Unlock funding opportunities, create employment, and secure income from their own capability and involvement.

Biomass Fuel Supply Strategy

Procurement of Long Term Fuel Suppliers

Open National Bidding method in line with section 29(b) of the Public Procurement Act; where potential bidders will be entities incorporated in Namibia with no less than 51% equity that is owned by Namibian citizens of which no less than 30% is owned by previously disadvantaged Namibians.

- Electronic Reverse Auctions or
- Open National Bidding
  (i.e. fixed price vs. fixed volume allocation).

This approach will allow NamPower to set-up the most economical Fuel Supply Chain as the best priced and quantity combinations may be used to meet the Power Station requirements

Biomass Fuel Supply Strategy

Procurement of Ad Hoc Fuel Suppliers

- Small Value Procurement (limited to below NAD 15 000) provisions as per section 38 of PPA; and
- Small scale Restrictive Bidding (limited to below NAD 2 mil) as per section 31 of the PPA.
- For the Restrictive Bidding method, a Pre-approved Supplier Eligibility list will be developed and periodically (annually) reviewed and maintained by NamPower to ensure ad hoc flexibility and monitor:
    - Validity period for participation;
    - Eligibility requirements in terms of the Procurement Act.

All potential bidders to be Namibians or entities incorporated in Namibia.

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Fuel Supply Contracting and Term Sheet

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Fuel Supply Contracting

Site Specific Harvesting Plan

Detailed Farm Map indicating:

- Sensitive and No-go areas
- Targeted harvesting area (to meet the TE/ha requirements)
- Different areas and methods (if applicable)
- Access routes
- Facility areas (i.e. Water, Accommodation, Ablutions, etc)
- On-Site stockpiling areas
- Buffer zones

SHEW File Requirements

- Record keeping of incidents and accidents
- Operating procedures
- Risk assessments

Estimated Schedule of harvesting progress

Monitoring details

FSA Term Sheet

Fuel Supply Agreement: Key Heads of Terms*

* Long Term Fuel Suppliers

1. Effectiveness and Term
2. Ownership
3. Fuel Quantities
4. Parties' Obligations
5. Monthly Nominations
6. Consequences of Non-performance
7. Liquidated Damages
8. Events of Default
9. Delivery, Acceptance and determination of Quantities
10. Fuel Sampling
11. Weight Adjustments
12. Rights to reject Fuel
13. Fuel Quantity
14. Payment & Invoicing
15. Boiler plate clauses
16. Fuel Price Escalation
17. Force Majeure
18. Termination
19. Change in Law
20. Schedules and Appendices
    - Fuel Specification
    - Form of Performance Guarantee
    - Fuel Delivery Schedule

FSA Term Sheet

Effectiveness and Term

The Effective Date for the FSA is when the agreement comes into full force and effect and will occur on the date of satisfaction, or waiver of the following Conditions Precedent.

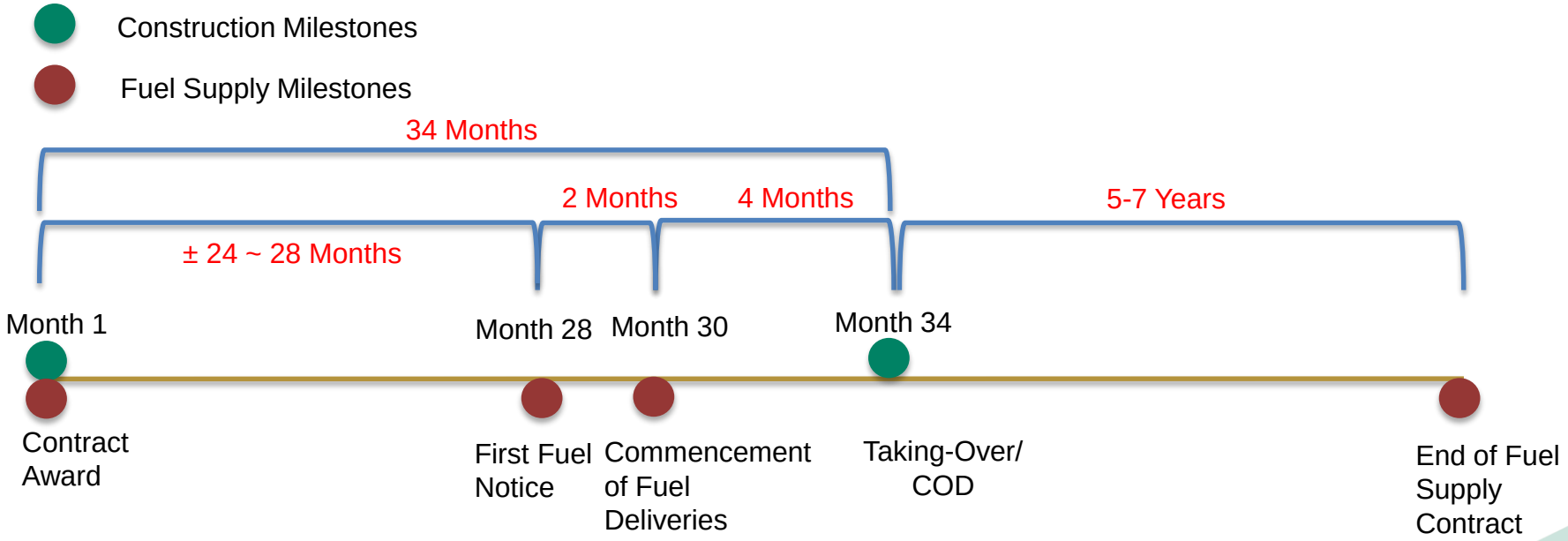
- Contract Awarded and executed with an EPC.
- All approvals and consents to operate the Otjikoto Biomass Power Station have been obtained.
- That the Fuel Suppliers have obtained all approvals and licenses in order to proceed with harvesting.
- That the Fuel Supplier has issued a valid Performance Security.

Term commences on the First Fuel Notification for the First Fuel delivery by NamPower.

- It is proposed that the Term of the agreement be 5~7 years.
- There will be a “dead” period between Contract Award of the Fuel Supplier and the First Fuel Notification.

FSA Term Sheet

Effectiveness and Term



FSA Term Sheet

Ownership

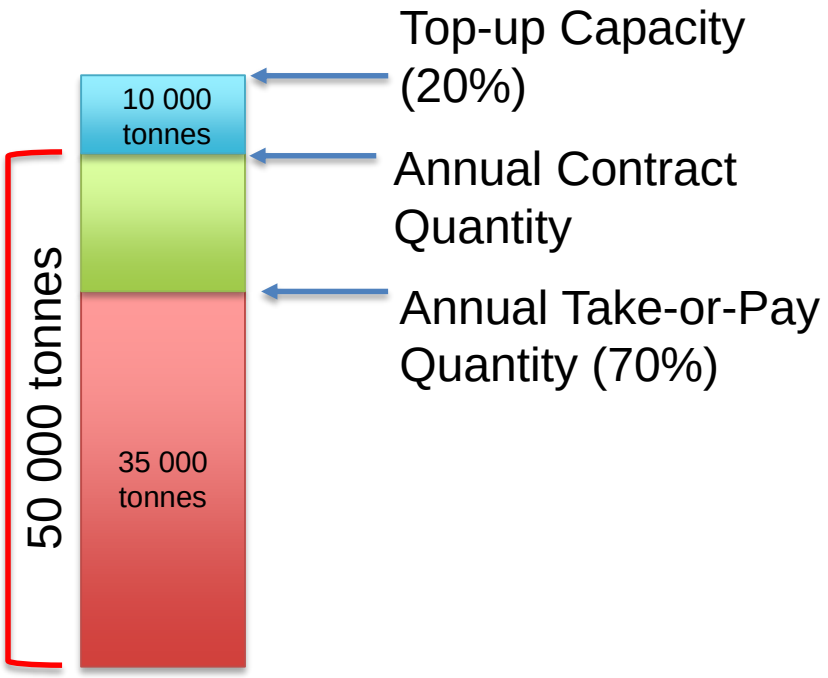
Title and risk of the Fuel supplied shall pass from the Fuel Supplier to NamPower at the Point of Delivery, following both:

- Acceptance of the consignment by the Fuel Receiving Official; and
- Complete unloading of the full consignment.

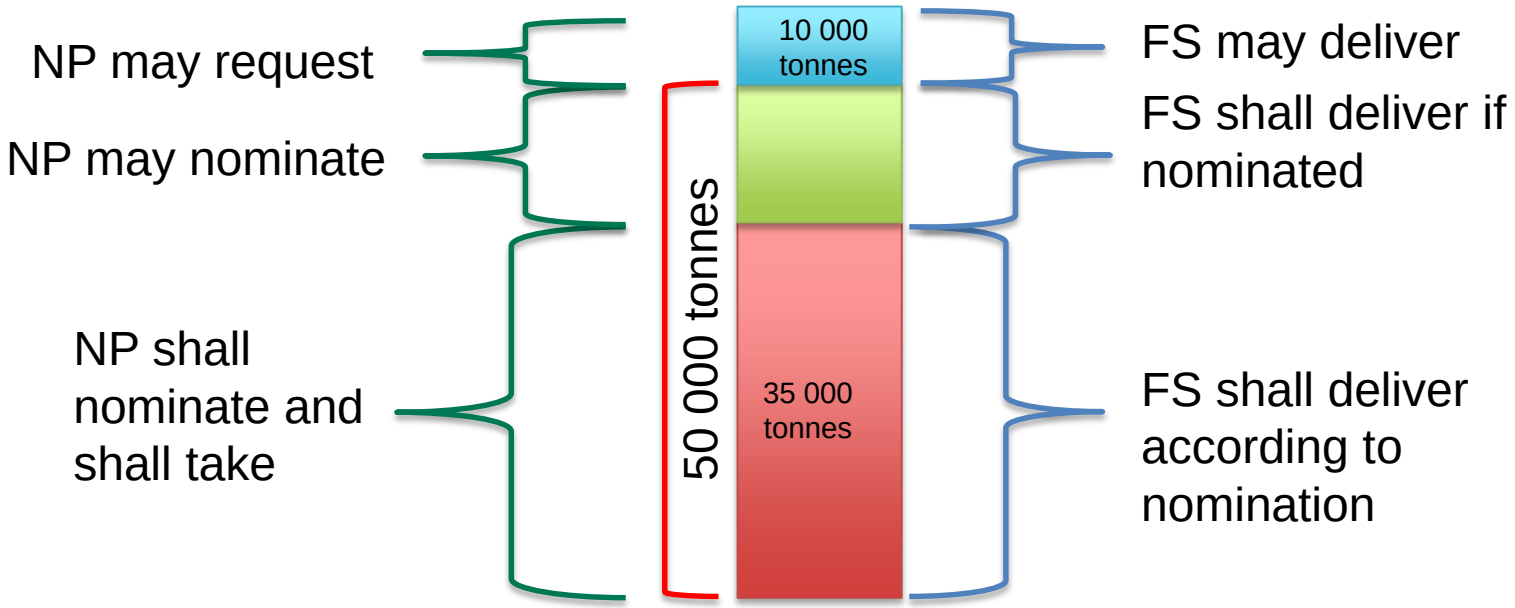
The Fuel shall be supplied Delivery Duty Paid (DPP) at the Point of Delivery as per the definition of the Incoterms 2010; between 07h30 to 16h30 from Monday to Friday.

FSA Term Sheet
Fuel Quantities

- Fuel supply will be contracted on Annual Quantity to provide flexibility for NamPower operations.
- Annual Take and Pay portion of 70% is required to provide certainty for financing purposes.
- Annual Fuel forecast will be provided for an entire contract year based on expected monthly operating regime.
- Monthly Nomination will be provided by the 15th of every month with
  - Minimum quantity of 2000 tons;
  - Maximum quantity of 7000 tons.
- Shortfall my be reallocated as top-up capacity for defaulting Fuel Suppliers.

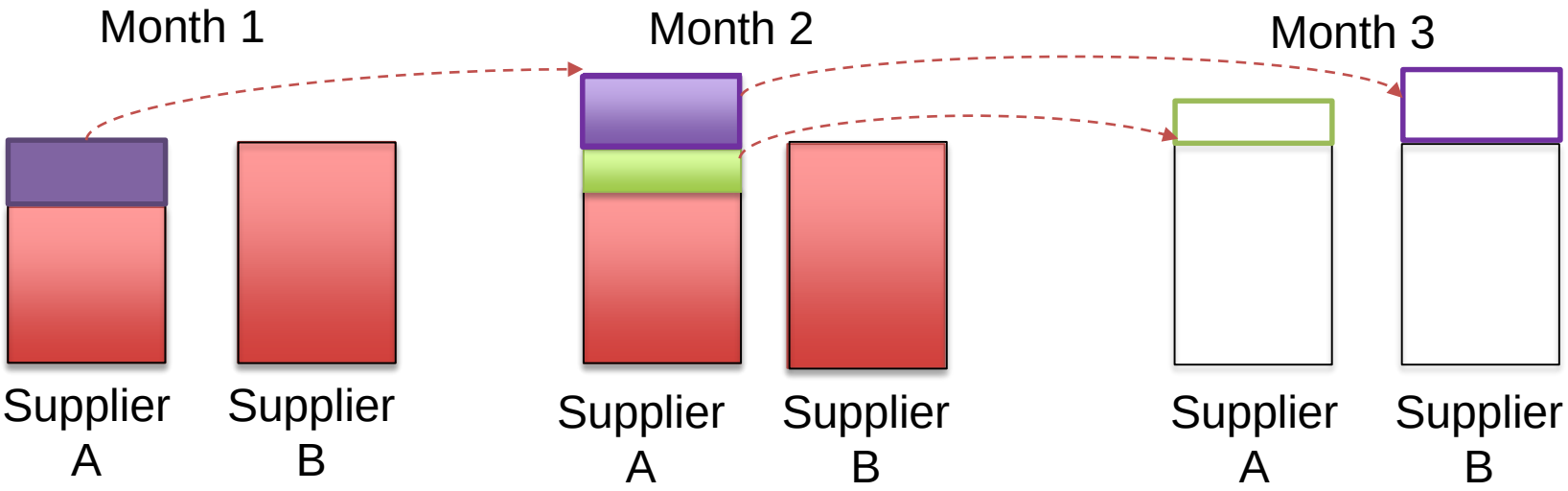


FSA Term Sheet
Parties' Obligations



All quantities delivered to Site may vary with a 5% tolerance

FSA Term Sheet
Monthly Nominations



Month 1:

- Supplier A & B have same monthly nomination however Supplier A has a shortfall in fuel delivered.

Month 2:

- Supplier A is required to make-up the previous months shortfall in addition to meeting the current monthly nomination.
- No change to Supplier B's monthly nomination.

Month 3:

- Supplier A fails to make up shortfall and therefore that shortfall is allocated to Supplier B.
- Supplier B is allocated a higher monthly nomination.

FSA Term Sheet

Consequences of non-performance

- Reassignment of Shortfall Quantity.
- Reassignment subtraction from Annual Contracted Quantity.
- Liquidated Damages on the balance of the Shortfall Quantity.

Liquidated Damages

- Long Term Fuel Supplier to provide a Performance Security of [20%] of the value of the Annual Contracted Quantity.
- NamPower may impose Liquidated Damages of [15%] of the Fuel Price for each tonne recorded as Shortfall and which has not been provided within the Make-up Period.
- To be re-issued and restored Performance Security with every Contract Year.

FSA Term Sheet
Fuel Sampling

- During offloading of each Fuel consignment, the Fuel Receiving Official will take a random sample of the Fuel for testing in the laboratory for moisture content.
  - The sample will be tested for moisture content by either of the following two methods:
    - Dry oven method | Halogen moisture analyser
  - The moisture content percentage shall be calculated as follows:

$$\text{Moisture content persenatge } (\%) = \left(\frac{weight\ of\ the\ water}{weight\ of\ the\ water\ + dry\ weight\ of\ the\ wood}\right) \times 100$$

- NamPower reserves the right to perform a detailed Fuel analysis of any sample of Fuel taken.
- The tonnage of the Fuel Delivered Weight will be corrected for moisture.

FSA Term Sheet

Fuel Price Escalation

NamPower pays Namibian Dollars per tonne of Fuel delivered.

It is proposed that the Fuel Price is broken down and escalated according to the following components and not a full escalation:

- Labour - escalated at CPI;
- Diesel - escalated (if required) at the Walvis Bay Fuel Price Index;
- CAPEX - not escalated;
- OPEX - escalated at CPI;
- Finance - charges not escalated;
- Profit % - not escalated;

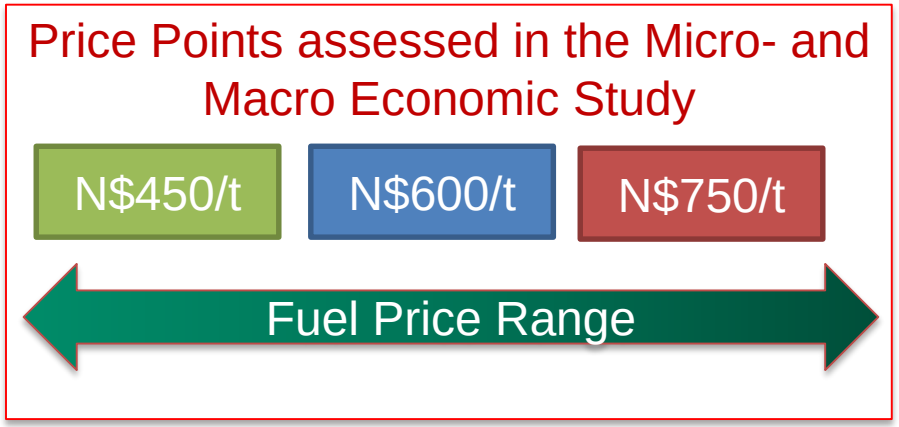
Escalation done on an annual basis.

Thought must be given to how the diesel price between Bid Price and First Fuel is managed (could be ± 24 months).

FSA Term Sheet
Fuel Price Indication

Power Station Tariff comprises:

- Fuel price
- CAPEX
- Operations & Maintenance costs



Fuel Price considerations

- Size of the wood chip, Volume allocation & distance of the power station

CAPEX considerations

- Final Bid Price, foreign exchange & Final O&M Cost (Excl. Fuel)

Competitive Process

- Balance between the power station and the fuel cost, there will be a cross over point where the project may become unfeasible.

Thank You

Any questions, comments or concerns, kindly email to:
biomass.stakeholder@nampower.com.na