

EPUPA

1. This is a very large, lumpy project with current cost estimate (presumably including access route, township, other infrastructure) çà \$500 m (+50%/-30% range).
2. Realistic smooth progress time schedule:
 - a. Negotiations (Angola - transfrontier installation. South Africa - 1991-1994 take or pay contract)

(Presumably want signature with Angola as soon as feasible but with SA after legitimate/new constitution govt.)
 - b¹ Financing/Final Engineering Study (preliminary design/engineering during "a")

1994-1995 (This is a very large project with very small borrower! And we - like lenders - can't afford to be radically wrong)
 - b² Integrate South Africa (Escom) purchase contract with borrowing contracts.

1994-1995 (The real security for us and for lenders is the South African take or pay contract which, therefore, must be at least as long as loan repayment period and with cash flow covering all repayments including interest.)
 - c. Construction Contract Letting/Mobilisation

1995-1996 (This is a case needing intl. tender - careful evaluation of bids. Build-up format for, array of contracts by contractor and building access route + construction site. How to divide contracts, e.g. access route from dam? Civil engineering from power plant? Equipment supply from installation? And who coordinates - doubt we have capacity to do so - and who is consulting engineer to approve work done and who auditor of bills need to be decided during "a"/"b")

d. Construction/Commissioning

1996-2000 (This is a multi year construction job! Four years from ground breaking after access route/base camp ± 6 months seems about right so long as no special problems, e.g. if rotten or faulted rock requiring grouting over extensive areas it will take longer.)

3. Therefore -

- a. no resolution of domestic power supply requirements before late 2000 can reasonably be expected from Epupa;
- b. the viability of project depends on an export contract which will cover at least full interest and repayment of capital cost over same period as repayment;
- c. the exercise requires engineering, design, contract formulation, costing, negotiating skills which neither NAWESC (Namibia Electricity and Water Supply Corporation? What does one call SWAWEK now ?!?) nor Ministry possess, or can acquire in terms of normal citizen and institutional expertise;
- d. because of cost, export possibilities (requirements!), debt burden, regional (with Angola-SADCC-South Africa) implications this is a strategic decision for Cabinet/President not just Energy/Water and will need detailed involvement (in knowing/approving what is happening, will result) of Commerce and Industry (Experts - Regional Economic Affairs), Finance (External Payments/Receipts), Planning (Macro Economic Aspects), Legal Affairs (contracts/treaties).

4. Cost/Revenue aspects

Pro Forma assuming \$500 million total cost including infrastructure charged to project.

<u>Item</u>	<u>Cash Flow</u>		<u>Profit and Loss</u>	
	<u>Year 2</u>	<u>(Year 7)</u>	<u>Year 2</u>	<u>(Year 7)</u>
Interest On \$500 m at 8%	\$40 m	(20 m)	\$40 m	(20 m)
Repayment At 10% a year from Year 2	\$50 m	(50 m)	—	(—)
Depreciation (Ass- umed Average Life 33 ¹ / ₃ years) Straight Line Method	—	—	\$15 m	(15 m)
Maintenance -2% (Estimate)	\$10 m	(10 m)	\$10 m	(15 m)
Operation -2% (Estimate)	\$10 m	(10 m)	\$10 m	(15 m)
TOTAL	£110 m	(90 m)	\$75 m	(55 m)

These are nominally in constant 2000 \$ prices. That makes sense for interest/repayment but not for depreciation (needs to be adjusted for replacement cost inflation although abstruse issues arise when finance used is basically loan and especially external loan) as well as maintenance/operation (need to be adjusted to - preferably - actual cost rise or - at worst as proxy - Consumer Price Index).

In practice can probably negotiate repayment periods/grace periods on different loans to stabilise interest plus repayment at - say - \$77.5 million a year. That means Year 2-11 cash flow cost (constant prices) at \$97.5 million.

5. If opportunity cost 'is' such that 15% on capital initially employed is target for first 10 years after start-up year then (constant prices):

Operation/Maintenance	\$20 m
Depreciation	\$15 m
15% on \$500 m	\$75 m
Total (Constant Price) Revenue per year Target	<u>\$110 m</u>

This is a shorthand/approximation route not a formal internal/discounted rate of return one! Over years 2-11 it would pay off \$500 m, pay interest of \$275 m, cover maintenance/operations of

\$200 m, 'meet' depreciation of \$125 m out of a nominal total of \$150 m = \$1,100 m. I.e., full cost of station/associated works/dam recovered and thus future revenue less operating-maintenance-depreciation pure profit. (Interim cash flow surplus = \$250 ≤ Depreciation.)

6. Suggest target revenue from sales to ESCOM be \$110 m/year in 2002 prices (with price adjustment clause).

a. Phasing

2001	Initial Year - Special Arrangements (Minimum \$70 million - interest + maintenance + operations)
2002-2011	<u>Definite - take or pay</u> \$110 m with price adjustment clause. Neither party has right to terminate. Namibia can invoke force majeure only under very restrictive circumstances (e.g. either Epupa or Ruancana collapses or power station destroyed -)
2012-2021	Ten year extensions with prices/terms/levels/etc.
2022-2031	To be negotiated in 2010/11 and 2020/21 respectively. If no agreement either side may give one year notice termination. In absence such termination notice (or while it runs) continue delivery/payment on basis of prior contract.

In practice I would expect 2012-21 and 2022-31 to be negotiated - South Africa will have growing power import needs and established source is likely to cost less than brand new one. Equally Namibia is likely to wish to keep selling power. But we might wish to reduce volume or substitute thermal power from a gas turbine station using Kudu or some other natural gas; South Africa might wish a larger, multi source delivery package. So renegotiation every 10 years quite equitable and if first contract does cover all repayments, etc., Namibia is not put at serious risk.

b. Structure

- Base level = 95% of Norm Units at a unit price giving total of (pro forma) \$110 m in 2002. Take or pay.
- Norm = 100% - delivery anticipated and guaranteed. Same unit price. (Get \$115.1 m)
- Guaranteed Ceiling = 105% of Norm Units. Availability Guaranteed by Namibia. Same Unit price. (Get \$121.3 m, rounded to \$121.5 m.)

Note - Presumably Norms will be monthly, unlikely ESCOM will want absolutely uniform flow although nearer that Namibia can get the better for us. Probably however the Take or Pay Minimum should be \$110 m until that number of units taken, i.e. may set off 105% in month three against 90%, 90% in months 1 + 2 unanticipated shortfall.

- Above Ceiling - Namibia will supply additional power at 110% (say) of basic unit price as available preferably with at least 30 day prior notice (waivable in emergency if power is available). Namibia to indicate quarterly 30 days in advance probable availabilities under this head.

Some type of premia/penalties for regularity/irregularity of supply on our side may be insisted on. But assuming tight force majeure these should not be chargeable on force majeure.

- Price Escalation Clause/Currency Clause Assumes price set in USA \$ (or SDRs or ECUs not Namibs or Rand). Important to us as our cash flow costs will be in terms of \$ or SDR or ECUs or currencies not fluctuating against them as much as Namib or Rand very well may.

Each year's price to be set on basis previous year's price times (1.0 plus previous available 4 quarters change in USA price index (or ECU or SDR price index if one of those, not \$, is payment unit). This covers us - more or less - on import component of maintenance/operations and to some extent depreciation as well as on any floating rate loans. More or less as individual prices may not vary with index and real USA exchange rate may vary

While b-c-d need to be estimated much more empirically, the above pro forma does suggest strategic value on GDP front. 3% to 4% gain vis-à-vis present GDP.

8. Over that period external balance gain would be:

▪ ESCOM Sales (Avg. per Para 7)	\$121.5 m
▪ Less Interest/Repayment	(77.5)
▪ " Operating/Maintenance Import Content	(10.0)
▪ <u>Net Forex Annually</u> (Average/2002 prices)	<u>\$ 33.5 m</u>
▪ Plus <u>pro forma</u> savings on alternative sources for Epupa local sales (<u>per</u> Para 7). <u>Say 25% x 87.5 m.</u>	<u>\$ 21.875 m</u>
▪ Total Pro Forma Balance of Payments Gain (2002 prices)	<u>\$ 55.375 m/year</u>

Again this is strategically useful. In post 2012 contracts it would be very much more so as Pro Forma Total Would Be Of Order of \$150 m/yr (in 2002) prices.

(Exports to Angola and Botswana are assumed to be negligible. Only adjacent North Bank Kunene in Angola and Western fringe of Northern Botswana would seem likely markets via local interconnections.)

9. Regional strategic implications are higher. Would be stable/long term export to South Africa strengthening base for broader 2-way trade development. Also interdependent link as Escom could not quickly, easily or cheaply jettison that amount of power and after first 10 years Namibia would not have cash flow problem sitting tight if Escom tried to get exploitatively low rates (i.e. in general Escom would blink first in stare out -). But implicitly needs Angola-Namibia or (better) SADCC perspective, coordinated sales to 'new RSA' strategy/phasing. Otherwise Escom can whipsaw Mozambique (Cahora Basa), Zambia (Kafue), Angola (one or more plateau dams) and us (Epupa). And in that event we and Angola would fall out with each other.

against currencies of loans and imports. But as repayment of loans is fixed and, in practice, the $(1 + X)$ term will always be greater than 1.0 we have a safety margin.

- The alternative (but still in \$ or ECUs or SDRs) escalation would be tied to some electricity cost index. In theory electricity costs (barring technological breakthroughs, e.g. cheap nuclear fission) globally are likely to rise more rapidly than general price index. So on face of it good for Namibia. But it is slightly riskier - for some years they might rise less fast. And in practice a standard USA \$ or ECU or SDR price deflator is securable and independent of contract but a standard world electricity cost (average or marginal) doesn't exist and the problems of negotiating and applying a proxy would be immense.
- Alternative two (still \$, ECU, SDR) would be to use a 5% a year inflation markup. Easy, certain. Barring USA (or EEC or OECD) collapse into high inflation, safe for Namibia. Could propose (if in - say - 1994 prospects low inflation over 10 to 15 years in Industrial North are as strong as now). Escom may not be happy - it gains on certainty but probably pays a bit more on average.

7. For the first period (through 2012) Namibia gets little on basic contract except it pays off whole cost of dam/plant/associated infrastructure. Gains are:

a. say 50% (maintenance + operation)	= \$10 m
b. if 100% normally taken (not take or pay \$110 m = 95%)	= \$5.5 m
c. and in $\frac{1}{2}$ years sales 105% (top guaranteed supply) or above averaging 110% x 5 or 5% a year	= \$6 m
d. all local (domestic) sales revenue less distribution cost <u>say</u> [need to estimate] 20% of base sales to Escom on average, e.g. 5% year #1/35% year #10	= <u>\$22 m</u>
Annual Direct GNP Gain	<u>\$43.5 m</u>
e. + Depreciation GDP Gain	<u>\$15.0 m</u>
Direct GDP Boost (2002 prices)	<u><u>\$58.5 m</u></u>

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10. Overall Epupa is strategic but not uniquely so:

- a. Kudu is comparable;
- b. Etosha - if proven - is larger;
- c. 'Kunenmund' oil/gas prospect - if proven - is larger;
- d. Two medium size, viable, base metal deposits (e.g. potential deep level at Tsumeb plus new ore body at Matchless) are at least comparable.

It has less uncertainty than b or c and probably less technical difficulties to solve than a, b, c. But it has more external finance and export contract problems than any. It is comparable term (i.e. 2000 odd production) to a, b, c. This suggests it be given relatively high Mines/Energy priority parallel to a-b-c but that "d" is somewhat more urgent (albeit probably not requiring as much direct Ministry or Govt. involvement).

To Do (Assuming Para 10 broadly agreed)

11. Create basic coordinating-monitoring-negotiating capacity in Ministry. Minimum one citizen graduate level, preferably 2 or 3 (one geology/mining, one economics, one law) plus consultants as needed. Probably full time expatriate civil servants later - height of specialised negotiation, design, construction.
12. Produce broad strategy/phasing paper for Cabinet amendment/approval. (Needs #11 to get drafted. Ministry + Power Corporation + Planning + this memo ideas may add up to enough or may need more external advice.) Not detailed at this stage.
13. Coordinating group - Energy/Mines (Chair), Power Corporation, Commerce and Industry, Planning, Finance, Legal Affairs, Water to:
 - a. agree work plan/target dates
 - b. agree division of labour
 - c. monitor progress.
14. Pre-Feasibility study

The assumed rough parameters are:

- a. 400 mw plus power at points of deliver (after transmission losses)

- b. at least 30 mw base per month (i.e. low month during drought year) with finite but low shortfall in case of consecutive drought years.
- c. sale of 200 mw to ESCOM will yield about \$110 m a year
- d. cost - including access infrastructure, township, transmission lines - will be of order of \$500 m including interest during construction
- e. approximately four year straightforward construction job (this is not self-evident - is the intent to drill diversion tunnel subsequently to house penstocks and power plant to divert river flow then protect actual dam base with diversion coffer-dam?)
- f. canyon reservoir adequate to meet "a" and "b" and not subject to heavy leakage. (Meeting "b" requires firm estimates on evaporation as well as modelled flow estimates for drought years sequence).

(Incidentally, "c"/"d" are almost surely now being done in 1990 prices. 1996/2000 will be higher. However, pre-feasibility stage can be done in current prices with rough inflation estimates if global and South African data give reason to project sales price (electricity price) will rise at same rate as construction cost in \$. [Note - the project is not on unless "c" is roughly valid and contract is in \$ - or ECU or SDR - not R or Namibs as the inflation/convertibility/exchange rate risks are too heavy for Namibia to assume.]

The purpose of a pre-feasibility study is to refine/confirm these basic parameters. If NAWESC (SWAWEK) has a good deal of physical and engineering data, only limited field work may be needed. A lot of desk work on construction and equipment costs, techniques and time to build, bulk power prices, water flow-evaporation-reservoir capacity-firm generating capacity modelling will be needed. You may wish a short term consultant (CFTC?) to help draft terms of reference for pre-feasibility study. The study itself should take 3 to 6 months and should be begun in mid-1992 (unless parameters above are so far out corrected data shows non-viability). Probably best to seek technical assistance finance from a country which can produce expert consultants on hydropower (all aspects) but is not likely to be a serious contender for main construction contract (supervision or equipment contracts less

conflict of interest problems). This suggests Norway and Norsk Hydro or a consulting affiliate thereof or Canada and consultants who have experience in Northern Quebec hydro projects.

15. Angola/Regional Aspects

EPUPA itself raises limited (if any) water rights issues not already arising from negotiation of Namibia offtake for national carriers/northern irrigation-domestic-livestock use/flow to Ruacana. (Those will be treated in separate memo.) Angolan negotiations turn on two aspects -

- dam is transborder (albeit nothing on Angolan side, no flooding of significant used areas) and forecloses Angola building a dam on Kunene downstream of Ruacana
- Angola also has plans/hopes to sell power to ESCOM

The first of these considerations can presumably be solved fairly readily by normal bilateral negotiations. The second should be placed in forum of SADCC Energy Sector (which happens to be coordinated by Angola and has both a serious secretariat and serious regional power sources/uses perspective scenarios which could be broadened to include South African interactions.

There are several potential suppliers to ESCOM:

- a. Cahora Basa #1 - existing contract. Rehabilitation of lines will take two years from date of adequate security to begin. Perhaps flows late 1994. (ESCOM seems to foresee 1995.)
- b. Cahora Basa #2 (Expansion). Has alternative Zimbabwe, Swaziland, Mozambique, Malawi markets Mozambique will wish to maximise but some added sales to South Africa likely. Dates unclear. Probably 1 to 1½ years installation turbines building transmission lines. 1995 possible operational date but more plausible 1998-2000. Lowest cost source because only added generation capacity at existing dam.
- c. Angola - several potential sources ranging from rehabilitation through under construction to be designed/built. Given transition

to peace, domestic demand, cash flow constraint (hydrocarbons are more attractive and easier to finance exports for Angola), time to complete dam build transmission lines, realistic availability dates if go ahead now could be 1997-2002 (which would conflict Epupa) but Angola could well decide alternative uses of investible funds are more attractive (a proposition I would consider wholly valid) and work to 2005-2010 on line (which gives Epupa 2000 slot).

- d. Zimbabwe - Botswana - Swaziland - conceivably thermal stations (coal) of large size producing for domestic plus ESCOM market would be viable. But unlikely to be cost attractive in comparison to Cahora Basa or Zambesi facility hydro for Zimbabwe. Swaziland/Botswana more likely as each can have viable thermal plant only on a scale requiring exports. However, amounts small relative to a, b, c, Epupa so manageable.
- e. Highland Waters (Lesotho) - present project seems to have relatively small hydropower component, largely for Lesotho. But earlier variants did provide for substantial power exports as might a later phase. Probably 2005 at the earliest before (amended) power component could be large.
- f. Kariba/Kafue/etc (Zambia). Capacity is there (after rehabilitation). Rehabilitation-transmission lines-added generating capacity could in 2-3 years produce substantial (much less than Epupa) availability. Zambia needs exports. But how Zambia is to raise \$200 million (say) is something else. With impending change in governments it is unlikely any stable relation on economic programme with Bilaterals/World Bank before 1993/94 or willingness to discuss supporting power sale project until 1995/96. Then 2-3 years feasibility plus 2 to build = 2000/05 which is probably optimistic.
- g. Stieglers Gorge (Tanzania). Probably too far north. Much larger than Epupa although phaseable. Logical market beyond Tanzania is Kenya. Likely to be financed before 2000 (open by 2005) only if basically for domestic requirements though lumpiness means it will require an initial 5 to 10 year export contract. Preliminary export scenarios (TanESCO, Kenya Power, World Bank) are to North.

The SADCC involvement should be:

- a. inventory potential export power supply projects plus
- b. status reports (with planned implementation dates and evaluation of slippage likely plus subsequent updatings)
- c. scenario drafting on phased build-up power exports (within the 10, to Kenya, to South Africa)
- d. development joint negotiating strategies and exchange of information in respect to -
 - i. construction contracts
 - ii. financing structures
 - iii. power sale negotiations

(We have much to gain by exchanges. Strengthens position of each vis-à-vis builders, financiers and especially buyers. For ESCOM to pursue offers to several of us while we keep each other in the dark is a wonderful way to get best terms... for ESCOM that is!)

This should be proposed, agreed, begun as soon as possible (not waiting on pre-feasibility. Epupa will be on sooner or later and some sales to ESCOM pretty soon).

At the later stage (Legitimate or Interim Government - say 1994) South Africa should be brought into the energy sector of SADCC. There are mutual interests and once contract negotiation information exchange is established fact South Africa couldn't block it.

16. External Finance/Repayment (Pro Forma)

It is assumed that the loans raised externally equal full cost of project. Any "equity" requirement in loan agreements is assumed to relate to NAWESC (SWAWEK) as a whole not Epupa separately. It is similarly assumed that take or pay level receipts must cover all foreign exchange costs and within 3 years all domestic operating costs. (NAWESC should overall have a positive cash flow. But this is better reinvested in domestic water/power distribution investment than in an export project which should be designed to stand on own feet. The same applies to domestic borrowing capacity.)

All data are pro forma example and assume \$500 m full cost including capitalised interest during construction which is assumed to be 'paid' out of \$500 million loan total.

Table 15-1

<u>Source</u>	<u>Amount</u>	<u>Grace</u> ¹	<u>Repayment</u> ²	<u>Interest</u> ³
AF Dev Fund	\$50 m	6	5	1%
AF Dev Bank	\$50 m	1	10	9%
World Bank	\$50 m	6	5	9%
Export Credits	<u>\$350 m</u>	1	10	8%
	<u>\$500 m</u>			

Notes:

- ¹ Years of Grace from Date of Commissioning.
- ² Years of Repayment after end of grace period. Assumes 2 instalments per year at end of June, December.
- ³ AF Dev Bank, World Bank might be floating rate. All rates rough guess as to 1996-2012 levels. They are more or less present levels which are historically high, especially in real terms.

These are broadly plausible projections. On first three slightly longer maturities should be attainable. On Export Credits 11 years after commissioning may not be possible but 8 to 10 should be. With longer repayment period (or weighted to final years repayments) of first three sources effect overall would be limited.

It is assumed basic take or pay (95% of norm sales) payment from ESCOM would go into an escrow account.

In Table 15-2 a Repayment Schedule/Escrow Account Flow is set out. This is pro forma. In practice more juggling in phasing grace periods to equalise annual payments would be possible.

An Escrow Account is assumed to satisfy lenders' desire to ensure - a) their payments are made "off the top" as are b) necessary operating and maintenance imports. This is feasible only for a largely export/one or a few customer project for which foreign exchange earnings cover a/b and can checkably be channelled.

The assumptions are:

- a. the "take or pay" Escom payments are deposited to an escrow account (in NAWESC's name) in - say - London;

- b. managed under agreed rules by a UK (or USA) Commercial bank (or for that matter a merchant bank or African Development Bank);
 - c. rules specify that necessary operating and maintenance imports are paid for first, then interest, then repayment;
 - d. after that balance goes to build up account until it equals estimated "a" + "b" items for next 12 months;
 - e. beyond that surplus balance paid out to NAWESC at quarterly intervals;
 - f. balances are invested prudently to yield best available short to medium term returns to account (i.e. ultimately to NAWESC).
- The table shows Escrow Account
 - a. easily covers payments in each year:
 - b. reaches 100% reserve level in the middle of Year 3 (with payouts to NAWESC substantially above domestic cash flow costs from Year 4
 - c. over Year 3-11 pays \$365 million odd to NAWESC versus \$110 million (Year 1-11) cash flow cost plus \$170 million odd cash flow plus 3% a year obsolescence/wear and tear depreciation.
 - Nominally NAWESC could have \$23.6 million cash flow deficit in Year 1-2-3. This is rather unreal:
 - a. ESCOM payments above 95% Take or Pay base go direct to NAWESC which should be at least \$4 million in Year 1 and \$5.5 million a year thereafter;
 - b. Domestic sales should be at least 5% of base (and would also go direct to NAWESC);
 - c. "a" + "b" would be \$8 million in Year 1 and \$30 million over Years 1-2-3. (Year 1 is initial operating year. Assumed base level sales to ESCOM 75% of subsequent yearly base. Grace period on repayment of principal on all loans, but interest is paid. Operating/maintenance assumed to be at standard normal year levels.)

Table 15-2

A. Interest/Repayment

Source	Year										
	1	2	3	4	5	6	7	8	9	10	11
<u>ADF</u>											
Interest	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.2	0.1	0.1
Repay	-	-	-	-	-	-	10	10	10	10	10
<u>ADB</u>											
Interest	4.5	4.3	3.9	3.5	3.1	2.7	2.3	1.9	1.5	1.1	0.7
Repay	-	5	5	5	5	5	5	5	5	5	5
<u>W. Bank</u>											
Interest	4.5	4.5	4.5	4.5	4.5	4.5	4.1	3.2	2.3	1.4	0.6
Repay	-	-	-	-	-	-	10	10	10	10	10
<u>Xpt. Credit</u>											
Interest	28	27.3	24.5	21.7	18.9	16.1	13.3	10.5	7.7	4.9	2.1
Repay	-	35	35	35	35	35	35	35	35	35	35
<u>Total</u>											
Interest	37.4	36.6	33.4	30.2	27	23.3	20.2	16	11.7	7.5	3.5
Repay	-	40	40	40	40	40	60	60	60	60	60
I and R	37.5	76.6	73.4	70.2	67	63.3	80.2	76	71.7	67.5	63.5

(All figures rounded. Small errors in interest computations possible.
Assumes interest and repayment of principal 30-VI and 31-XII semi-annually.)

B. Escrow Account

	1	2	3	4	5	6	7	8	9	10	11
Sales Receipts	77.5	110	110	110	110	110	110	110	110	110	110
Interest/ Principal	(37.5)	(76.6)	(73.4)	(70.2)	(67)	(63.3)	(80.2)	(76)	(71.7)	(67.5)	(63.5)
Forex Component Operating/ Maintenance	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Balance	30	23.4	26.6	28.8	33	36.7	19.8	24	28.3	32.5	36.5
Interest **	0.4	2.2	4.0	5.6	5.5	5.3	5.8	5.5	5.2	5.0	4.0
To Namibia ***	-	-	(6.4)	(37.6)	(42.2)	(25.2)	(29.9)	(33.8)	(37.8)	(41.7)	(113.5)
Carried	30.4	56.0	80.2	77	73.2	90.2	86	81.7	77.5	73.5	-

* Estimated at 50% of total

** Approximate. Assumes 6% on average balance

*** Amount leaving balance in account equal to next year's payments.

▪ This escrow cash flow (including to NAWESC) is quite adequate. However, NAWESC may not be in a position to pay full company tax using a 3% depreciation rate (unless sales above norm to ESCOM and relatively high domestic sales take place) until Year 11 although on the face of it this should be possible from Year 3. However, this could be handled by e.g.:

- a. an initial allowance of 25% + balance of 75% at 5% a year for 15 years
- b. 10% a year for 10 years (with unused balances of depreciation allowance carryforward allowed for - say - 6 years).

Either would in fact be a conservative depreciation tax allowance policy (i.e. greater generosity likely) so no very evident problem of unhelpful precedent for other investors to cite would arise.

17. Once:

- a. pre-feasibility study completed
- b. regional arrangements made
- c. pre-negotiating meetings show ESCOM interest in adequate volume/price

then need in parallel to proceed to:

- i. engineering study
- ii. ESCOM contract negotiations
- iii. financial mobilisation

and after that:

- iv. construction contract.

18. Engineering Study

Main items -

- i. geological/hydrological study
- ii. refined river flow and variance, reservoir capacity, evaporation-generation capacity by month and variance modelling
- iii. design dam-powerhouse-transmission lines-associated works-access road-other required infrastructure
- iv. construction technique/sequence/time profile modelling

- v. construction cost estimation and variation modelling
- vi. maintenance and operation cost estimation and variation modelling
- vii. revenue estimation (Take or Pay plus Additional Basic to ESCOM, plus Domestic Sales, plus Any Additional to ESCOM) and modelling at constant 2001 (Year 1) prices
- viii. modelling of alternative price adjustment formulas (see discussion at Para 6-b above).

While NAWESC and Ministry (plus Inter-ministerial Working Group involving Finance, Planning, probably Commerce) should be involved, the overall study will need a consulting team drawn from a company which as a consulting firm and/or a hydro power operator has substantial experience. (It may wish to hire in expertise itself.) Norsk Hydro (with NORAD finance) is an example of a suitable firm.

Environmental/social impact studies should be done - if possible by Namibian experts working to - say - ministry responsible for ecology. In this case they may not be very significant -

- a. no population in gorge
- b. no usable land flooded
- c. no significant delta fishing industry (or delta!) at Kunenemund
- d. only ecological/scenic loss is gorge itself. Unless it is felt that loss is so great as to block use, then no evident case to amend/redesign dam.

NB - Spin-off gains are likely to be limited too. In principle the reservoir could be a freshwater fishing site and a tourist attraction. The first may be worth considering (doing a small/quick study) although access and distance from markets may be problems. For tourist purposes the location and the steepness of cliff walls above reservoir as well as alternative more accessible coastal, mountain, wildlife sites probably rule out early utilisation.

- Similarly side gains from water for irrigation or drinking are likely to be nil or negligible. The Kaokoveldt is not very populated nor is it suitable for irrigation. The water would be well below Oshikati/oshana level as well as that of Central

Plateau which would make pumping costs for use in North, Tsumeb area or Windhoek areas very high.

19. ESCOM Contract

Several features have been addressed in Para 6. There are two aspects:

- legal expertise to be sure intended results are provided for by words used and risks (e.g. of not getting full cost of facility plus operations plus loan interest) back from ESCOM over 11 years are minimised;
- economic expertise to analyse, formulate NAWESC/Namibia goals and the contractual means to achieve them.

Negotiating skills can/should come from both legal and economic personnel. Namibia has some legal and economic skills (e.g. Sr. Legal Consultant Bomani and Ministry Commerce lawyer Thornton are experienced and able). The negotiating team should be led by a Namibian (or at the least a contract expatriate in Namibian government service). Back-up advice (including references to parallel contracts) would however be valuable. The Technical Assistance Group (TAG) of Commonwealth's CFTC (already known to Ministry of Energy/Mines) is a world level source of such expertise.

20. Financial Mobilisation is formulating a package comprising feasibility-engineering-cost studies plus draft ESCOM contract (plus such proposals as Escrow Account) to put to possible set of financial sources. If the sources were ADB-World Bank-Bilaterals Namibia (citizen plus in-service expatriates) plus TAG advisory assistance could do the job.

Unfortunately \$100-200 million is probable ceiling from those sources (unless bilateral agency provision of large, commercial project loans come back into fashion!). Therefore, the bulk of the finance will have to come from export credits, i.e. state export import banks or credit guarantee agencies via commercial banks. That makes matters more complex -

- a. these lenders want different data and especially presentations than ADB/IBRD/bilaterals -

- b. in practice finance will be tied (or 90% tied) to purchases of goods/contract services from their companies -
- c. so that a series of consistent agreements (ultimately borrowing contracts) will need to be put together in parallel -
- d. and more lines of credit than are to be used will need to be lined up to leave room for competitive bidding.

(Key 'group' members would be - Japan, Italy, Federal Germany, perhaps Norway-Finland-Sweden-Denmark, perhaps Korea, UK, perhaps Netherlands.)

To put a package of this kind together (including having access to and initial favourable recognition by lenders) probably requires a merchant bank. Advice will be needed on which one - Standard Merchant Bank and Lazard's (of UK) are both competent but may or may not be optimal. (TAG, or the UK Commonwealth Development Corporation who might be interested in a small - \$5 m or less - loan, could provide advice on best merchant banks for our purposes). Merchant banks come expensive. A low retainer/per day fee will need to be balanced by a high "completion" bonus and vice versa. 1% of funds secured is a possible total (fees and bonus) cost for a small country - large project - initial donor perception of high risk activity like Epupa.

It is necessary to set guide-lines to keep Merchant Bank in advisory role under Namibian rule - they tend to run away with themselves once interested. In particular if possible the ADB-IBRD-Bilateral funds should be excluded from their bonus fee base. (Not obviously per day fee if asked to do some modelling or similar work.)

Unless it changes greatly the International Finance Corporation of the World Bank is an unsatisfactory merchant bank or source of funds. It is very unwilling to listen to what client wants, to be accountable, to believe anybody else knows anything, to act expeditiously or to be satisfied with a role as a small (\$25-50 million) lender within a package. Further, it will surely spend a year arguing Namibia should find a private company to finance-build-operate for 25 years and then hand over to NAWESC. That idea is not very appropriate given the role of domestic sales and interaction between transmission lines for ESCOM flows and national grid. Nor do I suppose any would-be financier/buil-

der/operator would appear. Then they would want a joint venture with ESCOM (likely to add little to safety but reduce gains significantly) or propose selling 50% of NAWESC to private sector or dividing into NAWC and NESC and selling 50% of latter. Neither is very attractive (to Namibia nor, I fancy, buyers) but all four proposals in sequence could waste years. IFC likes to think it is entrepreneurial wing of World Bank group but has no sense of value of time, of serious bargaining or of separating strategic priorities from secondary issues.

21. Construction Contract

This will need careful structuring, e.g.:

- a. Lead Contractor/Manager
- b. Non-dam civil engineering (e.g. access road)
- c. Dam/Powerhouse construction
- d. Equipment Production (clearly likely to be more than one)
- e. Equipment Installations/Testing/Maintenance and Operating Personnel training
- f. Township Construction
- g. Township Furnishing and Finishing
- h. High Tension Line Construction

There is a good deal to be said for a/e being combined but b, c, d, f, g, and h being sub-contractors to lead contractor or at least supervised by him as NAWESC/Govt. of N's agent. This suggests the design/engineering consultants if they are a large operating company like Norsk Hydro are a potentially suitable candidate. (This should not be a single contract nor a pre-agreed sequence. Otherwise they have every incentive to "gold plate" engineering and inflate cost and time estimates at design/engineering stage to make life easy for themselves as lead contractors!)

A series of standard contract issues will arise:

- I. Lump sum, fixed price, cost plus (ugh!)? Lump sum to "a" with very tight limits on escalation reduces risk. It also means "a" will be charging a risk element in his bid;
- II. penalty clauses for late completion or inability to perform to rated capacity. Linked to retention clause, i.e. at least 10%

not paid over until NAWESC/GON "accepts" (legal term) finished project;

III. local sub-contractors - - little real capacity except perhaps "b", "f", "g". Could provide that they can tender and that "b", "f", "g" will be in chunks manageable for moderate sized firms and that they have a 10% (maximum?) preference;

IV. local purchases - beyond "g" not clear much available. Cement theoretically but some may need to be special (e.g. 'drying' under water), all needs to be higher specification/lower variability (except for "f"), the total is so large relative to normal demand it is hard to see how a domestic plant could accommodate.

V. taxation - horribly complicated to negotiate.

- personnel over 3 (6?) months in a year in Namibia should be taxed on portion of year's emoluments relating to period in Namibia;
- profits on work in Namibia (a-b-c-e-f-g-h) should be taxed at normal company tax rates. Not doing so benefits almost nobody except Treasury of head office country. In practice companies (and World Bank) will accept this but only when pushed;
- import duties/general sales taxes (or VATs or intermediate forms) probably should be exempted for simplicity in contract price negotiation. (There is an argument against this because in this case it de facto subsidises the electricity. But most of the main purchases are likely to have nil or low tax rates.)

(Note if import duty is exempted then there is a problem for local producers which justifies a 10% or 15% preference margin to offset - roughly - lack of protection.)

- minor taxes/fees, e.g. rates, stamp duty, licenses. In practice companies do not greatly mind paying if they can estimate total to include in costs when bidding. What they fear is sudden increase (also applies to import/sales taxes). This can be handled by providing, a) pay taxes, and b) if payment in any year exceeds "X" (say \$50,000) minor

taxes/fees then NAWESC will refund difference. This requires Namibian side estimating what taxes would be and setting "X" at that level.

- VI. Training/Initial Supervision/Initial Spares Stock. These should all be in contracts "a" and "e". (Spares also in "e"/"h"). They should be based on serious Namibian estimation of what is needed. The performance should be checked.

Usually this is a weak area. It is the exception for these clauses to be adequately detailed. Even more rarely are they monitored so non-compliance can result in withholding payment. Chief responsibility on informing negotiators what is needed and checking it is delivered should rest with NAWESC.

- VII. Continued Performance guarantee. There should be guarantees (and damage provisions including loss of sales) if specific equipment and/or overall project fails for misdesign, production or construction reasons within specified time periods. Adequate guarantees are never achieved but some can be. (For example, Tanzania did get substantial damages for faulty design and installation at a thermal power plant that broke down after about 5 years - normal life 20 to 25).

- VIII. Law of Contract - Arbitration/Settlement of Disputes. Ideally law of contract would be Namibian, place of arbitration of irresolvable differences Namibia, arbitrators one by each party and third by the other two or in case of disagreement by Chief Justice of Namibia. Nobody will agree to that. There is not much knowledge of Namibian law (which is more subject to change than most). The Chief Justice of Namibia will not be seen to be impartial ("disinterested") to outsiders. British law of contract may be acceptable and arbitration either under World Bank sponsored centre or International Chamber of Commerce of Paris procedures. This does matter - if something goes wrong on a contract of this scale tens of millions of dollars can be at stake. The most likely disputes are over cost escalation and delay in completion interpretations on whether chargeable and whether "excused" by "force majeure" ("Act of God" - sic!) clause.

In the ESCOM contract the same issue will arise. ESCOM will want South African law (which we won't if only because major changes are likely over 1994-2012 and are so uncertain) and final arbitrator - if disagreement - named by South African Chief Justice (whom we will - if only for historical reasons - not see as impartial). The parameters - British law of contract plus ICSID or ICC - for compromise are the same too.

This list is not exhaustive. A contract lawyer could add more! Exhausting then as well as exhaustive.

A Consulting Engineer will be needed to check and certify (or reject) work done. This company is professional/independent but paid by NAWESC and NAWESC's watch-dog. Very important both as on the spot ("real time") warning of problems and source of "at the time" impartial evidence if there are claims which go to arbitration. There are a number of international experience firms of this type in USA, Europe. (South Africa would be suspect - so few major construction companies true independence consulting engineers doubtful.) Auditing of Claims - especially under cost plus or escalation clauses - as to accuracy and allowability can be in Consulting Engineer's remit. Simpler that way. Some specialist needed to do it somewhere with who and where nailed down in advance.

On the construction contract I would recommend a basically Namibian team, especially as 3 to 5 years from now.

- NAWESC should have capacity to state needs, review design, evaluate construction contracts
- Namibia will have negotiated several large construction contracts by then
- Mines will have gained substantial negotiating experience in hydrocarbon and hard rock mineral negotiations
- Contracts (even if large), negotiations, and construction contracts should be areas in which government has, therefore, built up expertise.

How to build up international contract negotiating expertise is a question deserving some reflection. Two or conceivably three models are potentially usable -

Model 1

Ministry knowledge substance of its sector;

Legal expertise pooled logically in Legal but conceivably in Planning;

Negotiating expertise pooled in Planning or Finance to complement Ministries

Model 2

Ministry both knowledge of sectoral substance and basic negotiating capacity;

Legal expertise pooled;

Finance (or Planning) holding watching brief on financial/overall economic strategy aspects and providing back-up negotiating expertise when needed.

Model 3

1. Ministry basic substance, negotiating capacity, legal expertise;

2. Finance and Legal provide review - and back-up where necessary.

(Ministry here includes major parastatal enterprise responsible to it.)

My own preference is for **Model 2** (the 1980s one in Tanzania at least in respect to Mining and Energy) but I have seen **Model 1** work well (the 1965-75 Tanzania approach). **Model 3** requires each Ministry doing much negotiating, acquire a citizen or expatriate economic/contract lawyer, i.e. you, Commerce and Industry (which has done so), Water, Works. But even in 3 there should be a central review point or, a) legal, and b) financial/economic strategy issues which can also bolster negotiating capacity where needed.

- At some point when peak negotiations/strategy-tactics decisions on design/engineering, ESCOM contract, financial mobilisation and construction contract, a full time expatriate for two years as senior policy adviser on project may be needed. There is a lot of specialised work, Namibia is a small country, even in 1994-96 Namibian skill and experience levels will have more building up to be done. But that is a 1992-3 decision.

22. Who will be parties to contracts on the Namibian side will vary. In principle it might be ideal were all (except interstate waters

agreement, power export strategy aspects) contracts with NAWESC as the operating enterprise. In practice that is not possible:

- a. ADB and IBRD (and bilaterals) lend to governments (who then on-lend to enterprises). Unlikely they will alter this.
- b. Technical Assistance contracts will need to have Govt. of Namibia as a party (ideally with NAWESC too) because of donor procedures.
- c. Export credits - even with escrow account - will probably be easier if with government guarantee than on a "no recourse" (i.e. if NAWESC defaults lenders can seize dam but not send Govt. of Namibia a bill) basis.
- d. ESCOM may insist on a Govt. of Namibia signature to "insure" against 'political' order to turn off the line. (Frankly a bit fanciful to suppose this helps much but enterprises like to think it does!) If that happens NAWESC/Namibia could demand (new) Govt. of South Africa signature to "insure" against payments to escrow account being held up by South African Treasury or Reserve Bank. (A legitimate potential fear and an area in which a govt. signature might be helpful.)
- e. Construction contract may need a side letter from government to confirm clauses on tax provisions, payment remittances. Not desirable; alternative is to make NAWESC liable if tax provisions not implemented or remittances blocked.

23. General - Continuity

This is a long minute/memo. It does cover main areas/issues arising from EPUPA, broad parameters within which decisions can be taken, some major sub-issues and techniques.

But exhausting as it may be (to write or to read) it is not exhaustive nor fully articulated (and once it became more so would require regular updating).

Supposing successful on stream in 2001 by then there will be 2,000 odd pages of minutes and analytical memos and a shelf-full (literally) of technical studies.

Namibia needs a continuity person to keep an overview, coordinate, advise, get meetings held/memos and information flows moving. In fact 2 people - one in Energy section of Ministry and one in NAWESC. Lack of an historical memory will prove very time wasting and costly. By 1996 (target construction contract completion/construction start) your Minister may well have retired (as may NAWESC General Manager) and you moved to another post.

What I would advise is that a new, young, promising, professional (MSc desirable, degree needed) Namibian be named now. Over 5 years he would doubtless be promoted and would move from part to full (or almost) time on EPUPA. For example, by 1996 he might be Deputy Principal Secretary for Energy handling EPUPA and supervising rest of energy. Then advisers and technical experts (expatriate or Namibian) and his bosses could shift but there would be a stable focal point. And a Namibian one (not expatriate whether in service or consultant tied).

- RHG
Maputo
October 1991