

HOW BIG IS TOO BIG?

How much Capital do you really have?



Conclusions

- Solutions are Operation/Site dependant!
- Cost per tonne is very important in machine decisions however...
 - Capital cost is often more focus than operation costs
- Capital Risk Management is not prioritised directly – size down and manage risks
- Working Capital is critical for start-up operations, cash flow for all operations
- Design of ramps is generally not integrated with machine selection and total costs.
- The basics are the fundamentals - material density, blast quality, roadway designs, TRAINING, working hours and machine selection. Use your capital wisely!



BIGGER IS BETTER WITH VOLVO EC950E CRAWLER EXCAVATOR

9/12/2016

By Press Information

Do the bigger jobs better, stronger and faster with Volvo's new 90 tonne weight class EC950E crawler excavator. With over 424 kN of breakout force and 408 kN of tearout force, it offers the perfect combination of power and stability to handle high capacity duties in the toughest applications.



Surface mining Equipment

Loaders, Wheel

Description

Bucket Size	Dump Height	Truck Match	Weight	Engine	Capital Cost
Yd ³	Feet	tons	Lbs	HP	USD
3.0	9'4"		25500	149	\$175 750
3.5	9'4"		33190	180	\$219 700
5.0	11'10"	25-40	42270	211	\$244 000
9.0	12'1"	40-60	109249	501	\$793 400
11.0	13'1"	60-100	170100	625	\$1 290 000
16.0	18'5"	100-200	210000	801	\$1 752 000
18.0	16'9"	80-120	201741	800	\$1 774 800
21.0	14'8"	80-120	193108	690	\$2 223 700
26.0	19'1"	150-260	393000	1600	\$4 633 000
33.0	22'	190-320	440000	2000	\$5 924 000
53.0	24'	240-400	578000	2300	\$7 652 000

Source: Copyright 2011 InfoMine USA Inc.
EQ 16 - Surface Mining Equipment.



Surface mining Equipment

Trucks, Rear-dump, Rigid Frame

Description

Capacity	Volume	Loading Height	Weight	Engine	Capital Cost
Ton	Yd ³	Feet	Lbs	HP	USD
40.0	30.0	10'8"	75490	525	\$630 100
45.0	34.0	11'3"	81870	525	\$647 500
65.0	40.0	11'10"	87400	648	\$628 600
60.0	46.0	12'2"	90940	650	\$881 000
65.0	46.0	12'2"	101000	650	\$895 000
70.0	47.0	12'3"	105140	760	\$1 011 000
100.0	75.0	15'5"	158800	1042	\$1 050 000
170.0	94.0	16'5"		1200	\$2 120 000
200.0	137.0	17'1"	310525	1900	\$3 105 000
250.0	169.0	19'3"	355000	2500	\$3 912 000
360.0	290.0	23'1"	447538	3650	\$4 587 000
380.0	300.0	21'6"	473600	3350	\$6 050 000

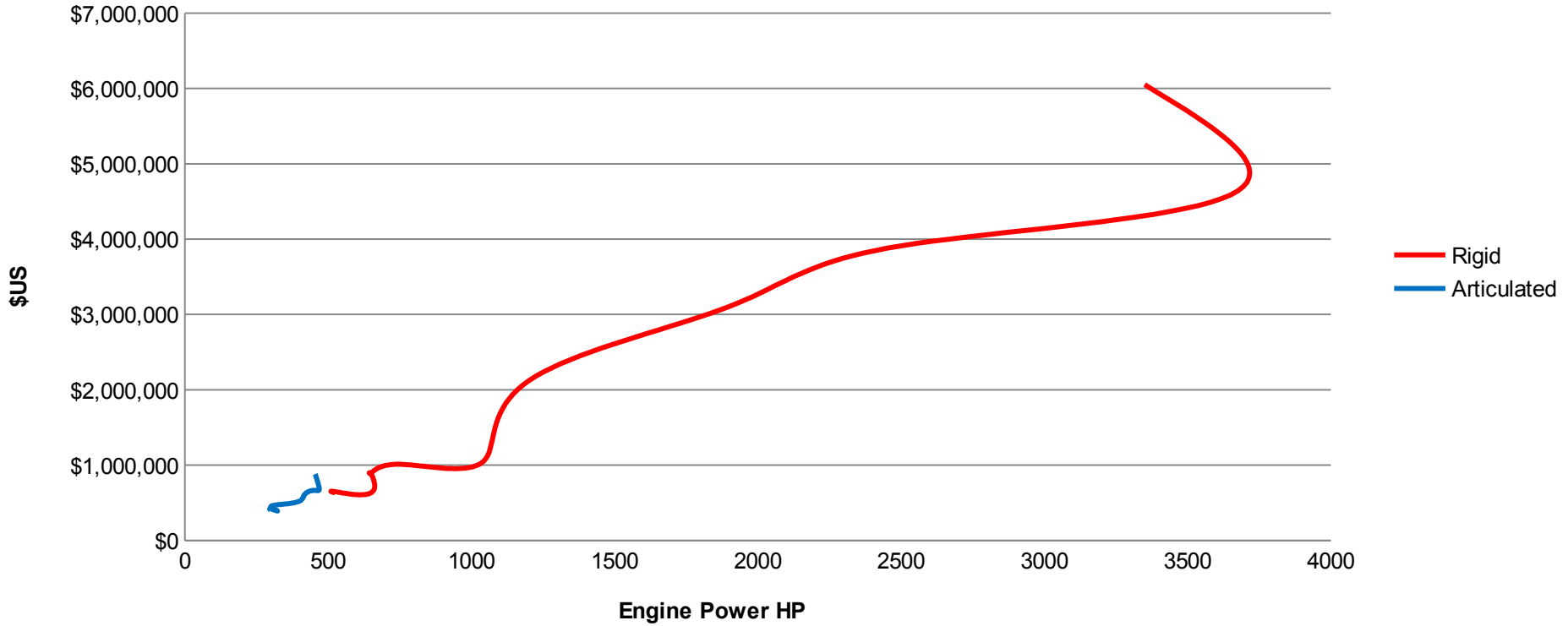
(mechanical drive)

Source: Copyright 2011 InfoMine USA Inc.

EQ 24- Surface Mining Equipment.



Rigid and Articulated trucks capital cost Verses engine power





Limestone - Blasted Properties

Material

In situ Bank Density t/bcm

Excavatability

Example

Swell Factors

Bank To Loader Bucket t/bcm

Bank To Truck Tray t/bcm

Load and Carry Loading Times

Properties

Load and Haul Loading Times

Use variable loading times

	Volvo L250H T4f
Volvo - A25G T4f Gen 2	02:01
Volvo - A30G T4f Gen 2	02:01
Volvo - A35G T4f Gen 2	02:41
Volvo - A40G T4f Gen 2	02:41
Volvo - A45G T4	02:41
Volvo - A60H T4f	03:22



Comparison of fleet size

Maximum Simulated
production 900
tonnes/hour

Distance of Haul Cycle oneway (m) 700

Loading Unit Name Volvo L250H T4f

Max of Fleet Production Per
Operating Hour (t/h)

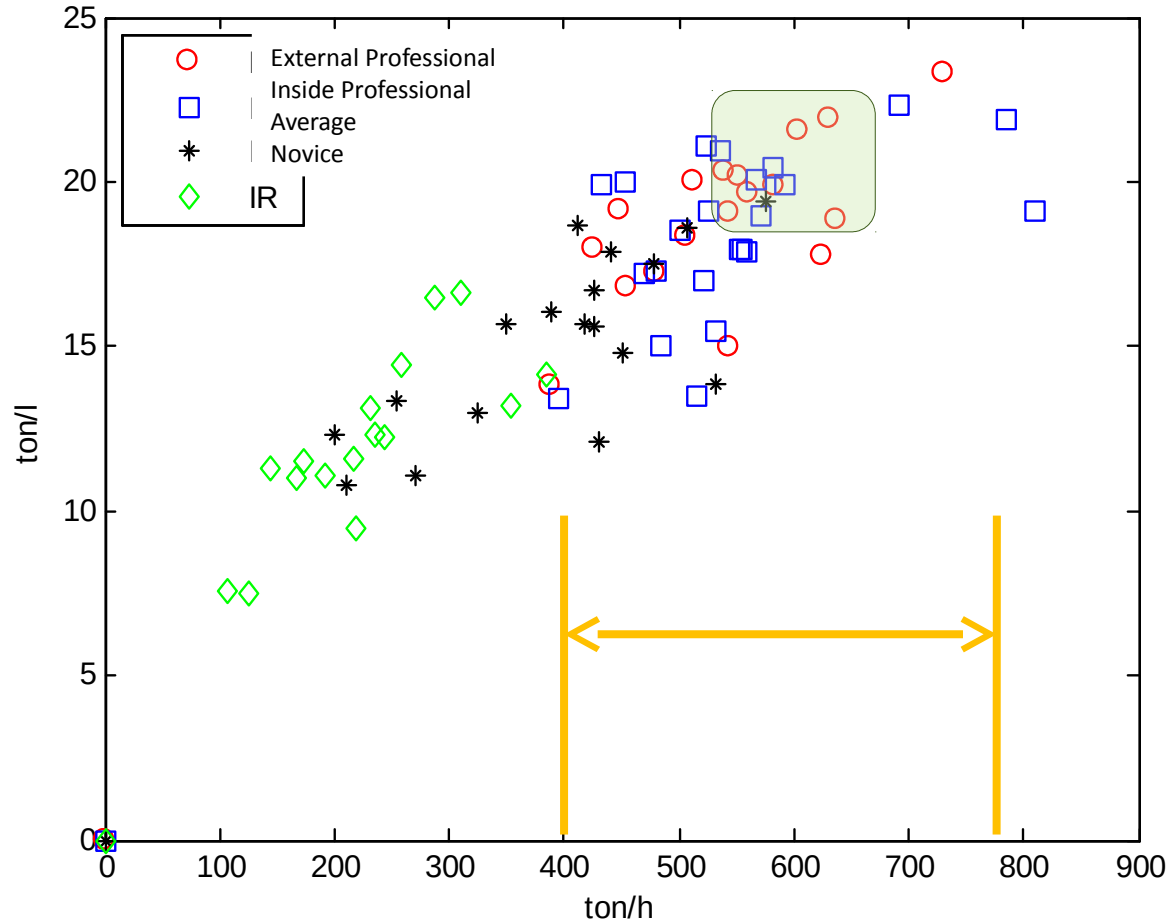
Hauler Options

Hauler Fleet	Volvo - A25G T4f Gen 2		Volvo - A30G T4f Gen 2	Volvo - A35G T4f Gen 2	Volvo - A40G T4f Gen 2	Volvo - A45G T4	Volvo - A60H T4f
	3			615	598	676	711
4	547						





Face Loading – Productivity vs. Efficiency





Feasibility studies
Permits
Infrastructure
Equipment
Stripping
Personnel/Administration

Time **Activities**

Working Capital
- Before income
source generated



Accounts will love this – Deferring cost

Time is Money! Nothing is for free!

Everyday you can achieve your goal without expenses (minimised) you have saved!

Alternatives for Machine Fleets / Production:

- Contractors – Flexible, experienced, Timely? Available? Delay costs, Dearer?
- Hire/Lease – Flexible, Operators?, Timely? Available? Delay costs, Dearer?
- Own Equipment – Loan/capital bound, Operators?, Timely?, Available? Upfront costs.
Third party ownership? Delay costs, Dearer?



Where is the money?

O&O = Estimated Ownership and Operating Costs

“Fixed”

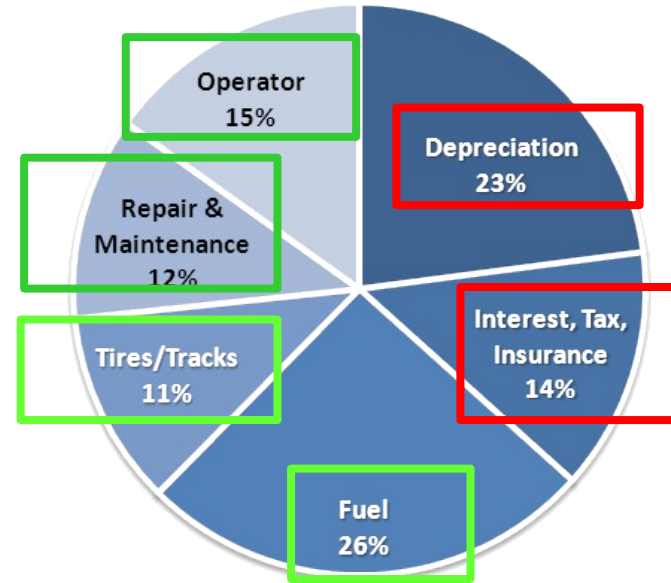
Ownership = Cost of capital or asset . . .

“Variable”

Operating = Cost of operating the asset . .

Usually expressed as \$ per hour.

TRAINING, PRODUCTION \$/TON, EFFECTIVE HOURS????



Talk with your OEM

- Volvo use a simulation tool to assist in decisions and risk management discussions
- Know what your materials are and your needs – define them to the OEM
- Know your potential working hours, scheduled effectiveness, planned plant shut downs etc.
- Understand your options and manage your risks
- Make money safely and efficiently – WIN WIN for everyone.



Final conclusions

- Manage Total cost of ownership (capital and operating) to be successful
- Manage and mitigate your risk
- Working Capital needs to be available well after the sale of your products
- Design and re-design and re-evaluate you operational activities
- KISS works well (Keep I Simple)- material density, blast quality, roadway designs, TRAINING, working hours and machine selection.



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Thank You for your Attention.

Questions?

