

CH0401 Process Engineering Economics

Chapter 2 – Balance Sheet and Cost Accounting

Lecture 2c

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- 1 Capital requirements for process plants
- 2 **Balance Sheets**
- 3 Earnings, process and returns (Income statements)
- 4 Economic production, break even analysis charts
- 5 Cost accounting - pre construction cost estimation - allocation of cost.

Balance Sheet

The balance sheet is a representation of the capital items or assets owned by company and the items owed by the companies. The two sets of items must be equal, or in other words, in balance.

To understand the balance sheet let us consider a simplified balance sheet for a petroleum company

Process Engineering Economics – *Balance Sheet*

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Oil properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Marketing facilities	14.9				
TOTAL FIXED ASSET AT COST	46.4		FUNDED DEBT	12.2	12.2
Depreciation	13.0		Outstanding stock	21.6	
			Earnings retained by company	19.2	
NET FIXED ASSET	33.4	33.4	OWNER'S INVESTMENT or NETWORTH	40.8	40.8
OTHER ASSETS	3.7	3.7			
Total Asset		64.1	Total Liabilities		64.1

* Assets, Liabilities and Total Values are in million dollars

Process Engineering Economics – *Balance Sheet*

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Oil properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Marketing facilities	14.9				
TOTAL FIXED ASSET AT COST	46.4		FIXED LIABILITIES	12.2	12.2
			Owner's investment	40.8	
Depreciation	13.0		or NETWORTH		40.8
NET FIXED ASSET	33.4	33.4			
OTHER ASSETS	3.7	3.7			
Total Asset		64.1	Total Liabilities		64.1

Current Assets

Capital represented by the items that are essentially the same as cash, such as raw materials bills that customers owe (repay) the company, finished products and materials in process are called current assets. **Cash and accounts receivables are called quick assets** because they could be converted with real dollars in short time

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Process Engineering Economics – *Balance Sheet*

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Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Oil properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Marketing facilities	14.9				
TOTAL FIXED ASSET AT COST	46.4		FUNDED DEBT	12.2	12.2
			Outstanding stock	21.6	
Depreciation	13.0		Earnings retained by	19.2	
NET FIXED ASSET	33.4	33.4	OWNER'S INVESTMENT	40.8	40.8
			or NET WORTH		
OTHER ASSETS	3.7	3.7			
Total Asset		64.1	Total Liabilities		64.1

Fixed Assets and Depreciation

The fixed assets are the capital represented by plant equipment, machinery, truck, land and buildings. Fixed assets also represents depreciable capital (except for land), their book value decreases with time and use and they are usually shown as net fixed assets.

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Process Engineering Economics – *Balance Sheet*

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	Other Liabilities	11.1	11.1
Oil properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Marketing facilities	14.9		FUNDED DEBT	12.2	12.2
TOTAL FIXED ASSET AT COST	46.4		Outstanding stock	21.0	
Depreciation	13.0		Earnings company	19.2	
NET FIXED ASSET	33.4	33.4	OWNER'S INVESTMENT or NETWORTH	40.8	40.8
OTHER ASSETS	3.7	3.7			
Total Asset		64.1	Total Liabilities		64.1

Other Assets

This section of the balance sheet shows the intangible capital represented by “goodwill”, patents, franchises and trademarks that are owned or controlled by the company.

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Process Engineering Economics

Balance Sheet

Current Liabilities

These are obligations that are amortized over a period of time. It represents the capital that has been obtained from the sources other than the owners of the company.

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Marketing facilities	14.9				
TOTAL FIXED ASSET AT COST	46.4		FUNDED DEBT	12.2	12.2
			Outstanding stock	21.6	
Depreciation	13.0		Earnings retained by company	19.2	
NET FIXED ASSET	33.4	33.4	OWNER'S INVESTMENT or NETWORTH	40.8	40.8
OTHER ASSETS	3.7	3.7			
Total Asset		64.1	Total Liabilities		64.1

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Process Engineering Economics

Balance Sheet

Funded Debts

Long term debt that the company has in terms of bonds and Mortgage loans

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accrued taxes	1.0	
Inventories	10.0		Accrued interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Oil properties	13.6		Outstanding bonds	7.0	
Plant equipments	17.9		Mortgages	5.2	
Operating facilities	14.9		FUNDED DEBT	12.2	12.2
TOTAL FIXED ASSET AT COST	46.4		Outstanding stock	21.6	
Depreciation	13.0		Earnings retained by company	19.2	
NET FIXED ASSET	33.4	33.4	OWNER'S INVESTMENT or NETWORTH	40.8	40.8
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Process Engineering Economics

Balance Sheet

Owners Investment Or Networth

This item sometimes called proprietorship (or ownership). The sum of stockholders investment plus the earnings retained by the company (surplus) is the net worth.

Assets			Liabilities		
Particulars	Assets*	Total*	Particulars	Liabilities*	Total*
Cash	8.9		Accounts payable	4.0	
Accounts receivable	8.1		Accured taxes	1.0	
Inventories	10.0		Accured interest	6.1	
CURRENT ASSET	27.0	27.0	CURRENT LIABILITIES	11.1	11.1
Properties	13.6		Outstanding bonds	7.0	
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TOTAL FIXED ASSET AT COST	46.4		FUNDED DEBT	12.2	12.2
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Therefore from the balance sheet statement it is noted that the Total assets value is equal to the liabilities.

Total assets = Total liabilities

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Equations Used

$$\text{Total Investment} = \text{Sum of the Total Assets} + \text{Working Capital} \text{ --- (1)}$$

$$\text{Working Capital} = \text{Total Investment} - \text{Total Assets} \text{ ---(2)}$$

$$\text{Total Investment} = \text{Total Fixed Assets} + \text{Other Assets} + \text{Current Assets} - \text{Current Liabilities} \text{ ---(3)}$$

From the balance sheet we can find that

$$\text{Total Investment} = 46.4 + 3.7 + 27.0 - 11.1 = \$66 \text{ million}$$

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