

Advanced Industry 4.0 ACPA

University of Wales Trinity Saint David
(MADE Project)

By

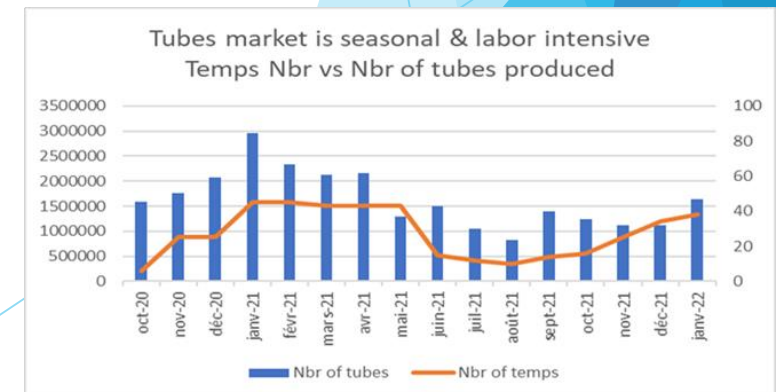
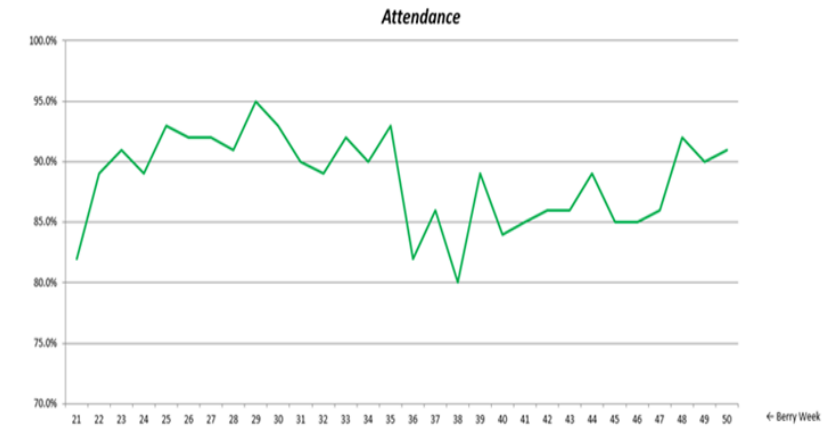
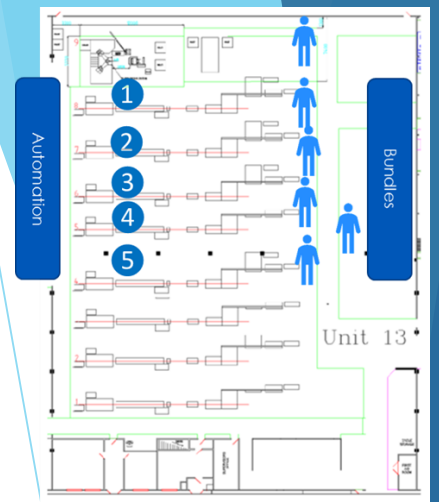
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26/05/2023

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Introduction

- In 1978 the first tree shelters were conceived and trailed by Graham Tuley of the UK Forestry Commission.
- Since then, Tubex have been researching and refining the range to offer increased benefits and establish safeguards as identified through many trials.
- The conversion part of the process involves inserting a tie into the tree shelter and its very labour intensive.
- Week on week labour fulfilment percentages are not getting better than 89% so how do we find the missing 11%? Is Robotics the answer?
- Within a manufacturing line that is very labour intensive due to the dextrous nature of the task, questions have been asked for many years if Robots can be used to support staff.
- Inefficiency's are currently with attracting temporary labour that has to remain temporary due to the seasonality of the business.

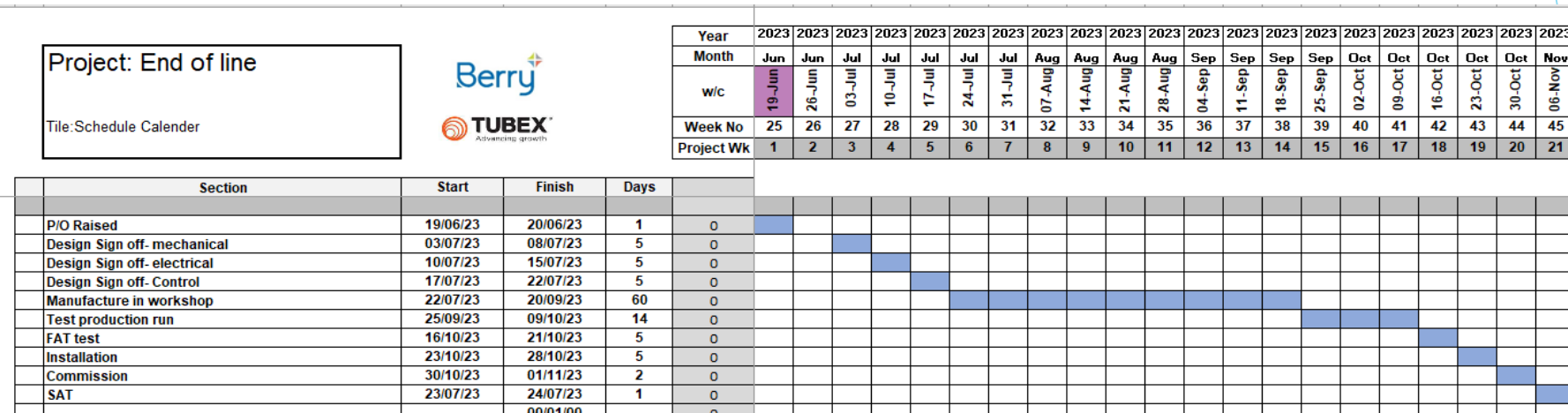


What does the project bring to the business

1st phase	Capex	Benefit hrs	Benefit	Payback Est
	482150	8527	124468	3- 5 years

- Fully automated end of line
- Product output improvement
- 8527 Labour hours saved
- Labour variance stands between 6 and 45 for temporary staff
- Difficulty to hire, churn rate = 1/3
- Inventory build-up needed
- Impact on lead time & sales during high season
- Cost avoidance on current machine guarding upgrade(~300k\$ per line)
- Improved Safety conditions
- Reduced administrative complexity during busy business season

Time line of implementation



- 21 weeks between order & line start
- 18 weeks between order & Factory acceptance test (FAT)
- FAT conditions very close to productions conditions
- Timing to be refined depending on how we want to approach installation
- Inventory build-up needed in case of installation during high season (There will be a cost required to build inventory).

Cost of the project

Steps	Task	GBP (£)
1 Phase	End of line Automation	477150
1 Phase	Additional (ancillary)	5000
1 Phase	Total	482150

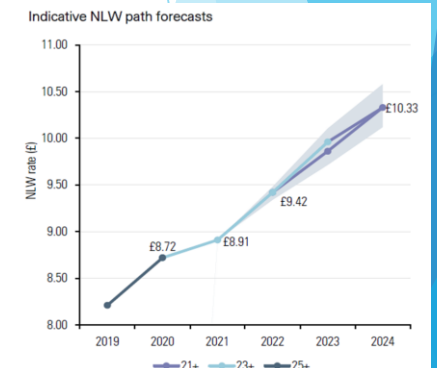
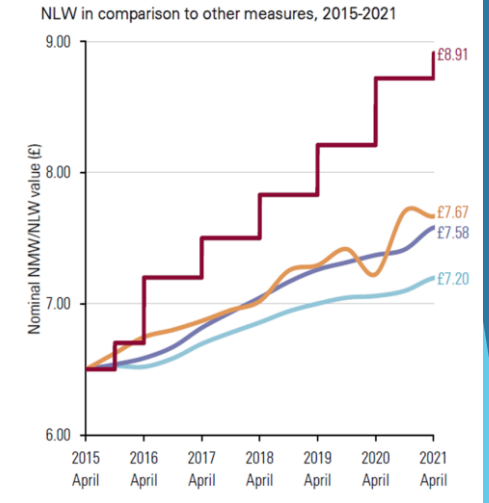
- Many organisations outside of the aviation or automation industry have been slow with the uptake of Robotics, with the message being the availability of cheap flexible labour out weighs the investment into technology (Payne, 2019)
- This may have worked in the past but is no longer relevant due increasing labour costs.
- There will be risks relative to improving technology and recent studies refer to a shortages of skills in relation to a small group of specialists, such as engineers at the interface with IT and programming skills.

Basic payback

Payback Period

	investmen	Yr1	Yr2	Yr3	Yr4	Yr5
Present value	-482,150	168,462	171,831	175,268	178,773	182,349
		-313,688	-141,857	33,411	212,184	394,533
Pay back Yrs	2.81	1	1	0.81		

← + ←



Indicative NLW path forecasts

Age	2019	2020	2021	2022	2023	2024
25+	£8.21	£8.72	£8.91	£9.42	£9.96	£10.33
23+					£9.86	
21+						

Life span

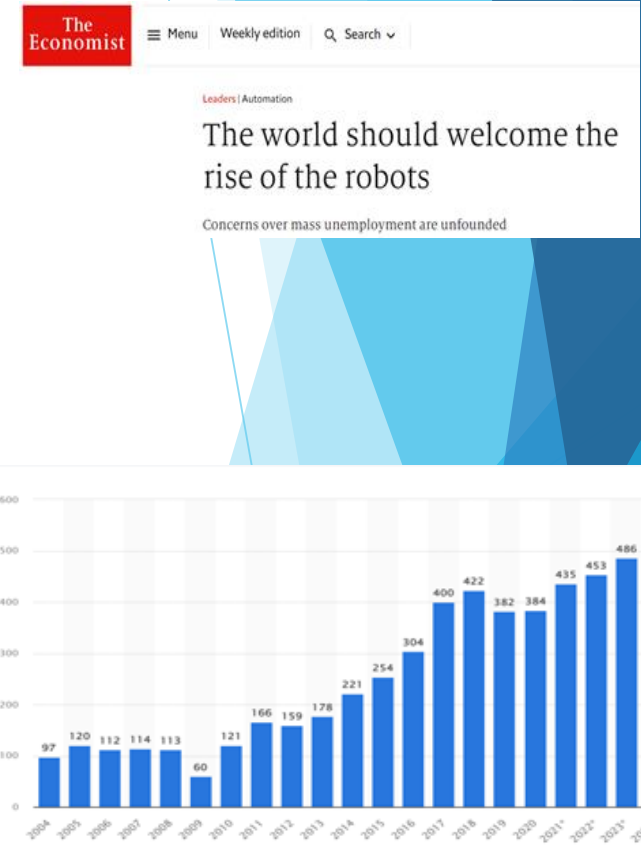
- For a project of this size the payback will have to be under 5 years but the lifespan of the project will be 10 years.
- Berry will depreciate the assets for 10 years as part of EBITDA.
- Robots can be used in different applications at end of life due to their build.

Ethics and disruption

- A key statement in this project charter is that ethically we don't want Robots to replace employees. These days Robots are also leaving industrial setting and entering every day life (economist 02/22)
- There is a place for both in our company but the main driver of the research is to ensure that we can fill the 11% gap without the reliance of temporary labour.
- If we could fill our vacancies 100% of the time and maximise line through put then a proposal such as this wouldn't exist.
- There will obviously be some vacancies lost to the robots but installing Robots will also create other jobs for more highly skilled employees. Worldwide installations of industrial robots from 2004 to 2020, with a forecast through 2024 is shown in the graph (Statistica, Nov 2022)

Any issues that implantation will cause?

Redundancy
Disruption
downtime



Business rational

- Positive NPV →
- Payback 3.17 →
- IRR 23.5% →

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
Present value	-482,150	168,462	171,831	175,268	178,773	182,349
Discount Rate (WACC)	10%					
Denominator	1.000	0.909	0.826	0.751	0.683	0.621
Future value	-482,150	153,132	141,933	131,626	122,102	113,239
NPV	179,881	-329,018	-187,085	-55,459	66,643	179,881
Pay back	3.17	1	1	1	0.168	
NPV using excel	180,017					

Project

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Project

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
Present value	-482,150	168,462	171,831	175,268	178,773	182,349
Discount Rate (WACC)	23.527%					
Denominator	1.000	0.833	0.694	0.579	0.482	0.402
Future value	-482,150	140,329	119,251	101,480	86,169	73,304
NPV	38,383					
NPV using excel	0					

Project funding options

- Internal Berry Global Capex
- Berry has a strong financial performance
- Capex can be shared within group and not just locally
- Tax Reliefs on Qualifying Capital Asset Investments available and currently being applied

A Global Leader

Founded in Evansville, Indiana in 1967 - NYSE (BERY)

A leading global design, engineering, and supply company for value-added packaging and protective solutions



Non-GAAP Financial Measures

	Actual									
	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Cash flow from operations	\$930	\$837	\$837	\$873	\$1,004	\$1,201	\$1,450	\$1,380	\$1,343	\$1,343
Capital expenditures, net	(174)	(142)	(282)	(242)	(233)	(299)	(420)	(474)	(487)	(487)
Payment of non-recourse agreement	(30)	(29)	(17)	(11)	(27)	(26)	(24)	(24)	(24)	(24)
Free cash flow	\$726	\$666	\$538	\$620	\$744	\$876	\$1,006	\$882	\$832	\$832

Strong Financial Performance Track Record

POSITIONED FOR CONTINUED REVENUE, EARNINGS, AND FREE CASH FLOW GROWTH

(\$ in millions, except EPS)	FY15	FY22	CAGR
Revenue	\$4,881	\$14,495	17%
Operating EBITDA	\$815	\$2,101	15%
Adjusted EPS	\$1.70	\$7.40	23%
Adjusted FCF	\$436	\$876	10%

RESILIENT BUSINESS MODEL

- Broadest Portfolio of Plastic Packaging Solutions
- Consistent, Dependable, and Predictable Cash Flows

Capital Allocation Strategy

Opportunistic and return-based focus

- Investing in growth markets (returns well above our WACC)
 - Healthcare
 - Sustainability-focused products
 - Pharmaceutical
 - Dispensing solutions
 - Beauty care
 - Foodservice
- Returning capital to shareholders (>\$700M in 2023)
- Continued focus on reducing leverage

Initiated New Cash Dividend Program

Strong and Dependable Free Cash Flow



Capital request

482150

Conclusion and recommendation

	investment
Present value	-482,150
Discount Rate (WACC)	10%
Denominator	1.000
Future value	-482,150
NPV	179,881
Pay back	3.17
NPV using excel	180,017
IRR	23.53%
ARR	26.67%
PI	1.37
BCR	0.37

Total Cashflow	876,683
Depreciation	701,346
Net income	175,337
project length	10
Average	17,534
ARR	26.67%

- The project sees a positive NPV with a WACC of 10%
- The metric Berry would be more interested in for Capital expenditure alongside EBITDA is IRR
- IRR for this project is a positive 23.53%. and a positive incremental EBITDA of £182k/5years.

Appendices

Calculating NPV

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
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Pay back Yrs	3.17	1	1	1	0.17	

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Profitability index

Project A

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
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NPV	179,881					
Pay back	3.17					
NPV using excel	180,017					
IRR	23.53%					

$$PI = \frac{PV \text{ of future cash}}{Investment} = \frac{662,031}{482,150} = 1.37$$

BCR

Project A

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
Present value	-482,150	168,462	171,831	175,268	178,773	182,349
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NPV	179,881					
Pay back	3.17					
NPV using excel	180,017					
IRR	23.53%					

$$BCR = \frac{NPV}{Investment} = \frac{180,017}{482,150} = 0.37$$

Appendices

ARR - accounting rate of return

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
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Cash in	£	Residual Value
Yr1	168,462	175,337
Yr2	171,831	
Yr3	175,268	
Yr4	178,773	
Yr5	182,349	
Net cash flow	876,683	

	701,346		
	Total profit	Years	Average
Average annual prof	876,683	10	87,668

	Investment	Residual	Average
Average annual prof	482,150	175,337	328,743

$$\text{ARR} = \frac{87,668}{328,743} \times 100\% = 27\%$$

$$\text{Annual Rate of Return} = \frac{\text{Average Annual Profit}}{(\text{Initial Investment} + \text{Future Residual Value})/2}$$

Project Analysis

	investment	Yr1	Yr2	Yr3	Yr4	Yr5
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NPV	179,881					
Pay back	3.17					
NPV using excel	180,017					
IRR	23.53%					
ARR	26.67%					
PI	1.37	660,546				
BCR	0.37					

Total Cashflow	876,683
Depreciation	701,346
Net income	175,337
project length	10
Average	17,534
ARR	26.67%

Appendices

Executive summary

Capex
\$482k

Incremental EBITDA
 **\$182k/yr5**

Payback IRR
3.17 Yrs 23.53%



What

- Design and manufacturing of full automated tie insertion in Tubex line

Why

- Elimination of Safety risk in the production area (interaction with former)
- High Seasonality business (difficult recruitment process)
- Reduction of 4 resources
- Saving of 10369 hours across all lines (Investment vs hours reduction = 45\$/hour)
- Automation will reduce risk of labor availability and future cost (~10% wage salary increase YOY)
- Potential capacity increase > 25% (not included on EBITDA)

When

- Project approval +6 months