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Making the Case for Energy Management Projects – Webinar One – Financial Analysis

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Two webinars – two aspects of making the case

- Webinar one: Financial analysis
  - Treating energy efficiency as an investment opportunity
  - Quantifying the financial value
- Webinar two: Building the business case
  - Understanding the decision-making process
  - Considering all the benefits
  - The One-Page Proposal

Workshop goal – two purposes – one path

Overall goal

To provide you with techniques, tools and hands-on experience with building the business case for an energy efficiency investment

External

Selling to your prospect

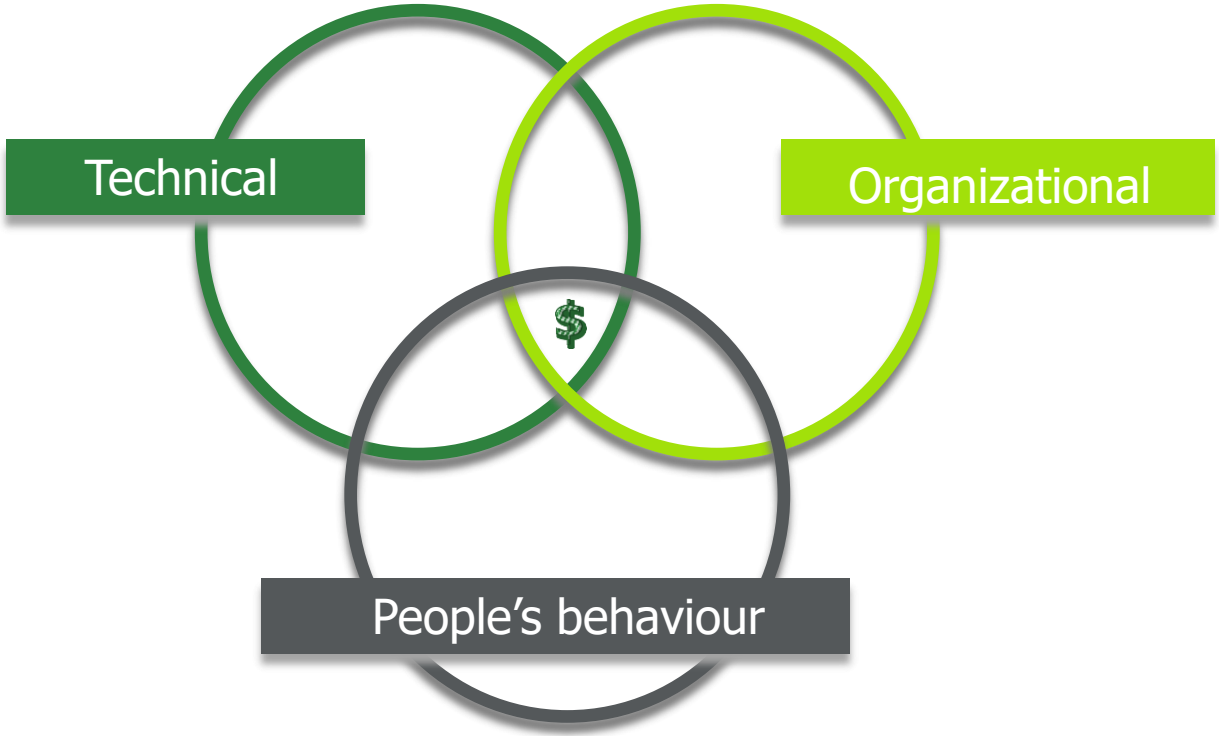
To a customer

Internal

Securing buy-in

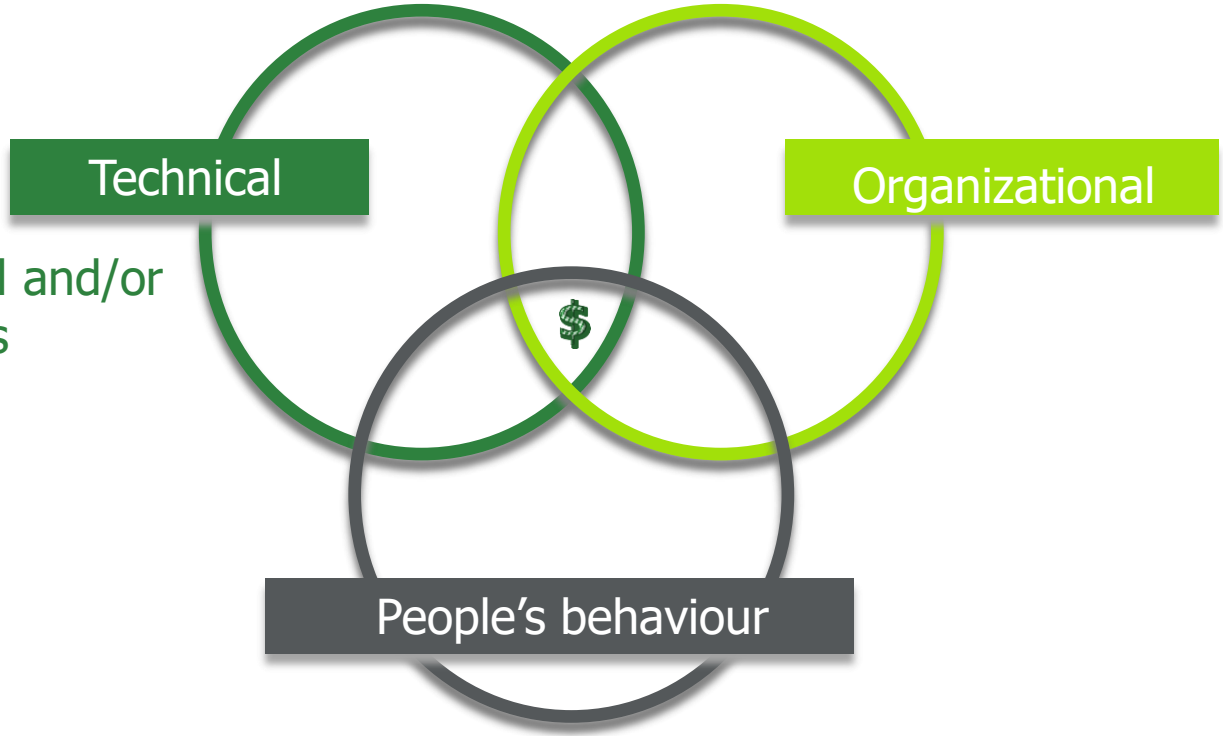
From a supporting staff and decision maker

The challenge of energy management

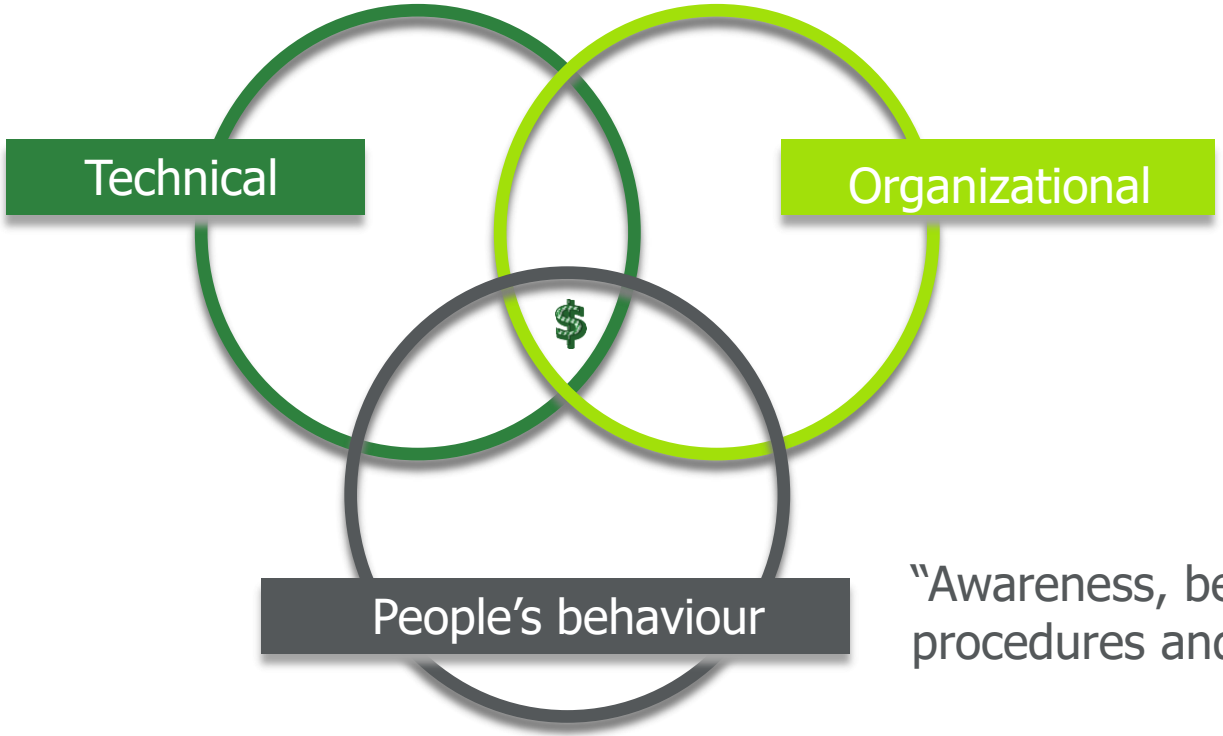


The challenge of energy management (2)

"Operational and/or technologies changes"

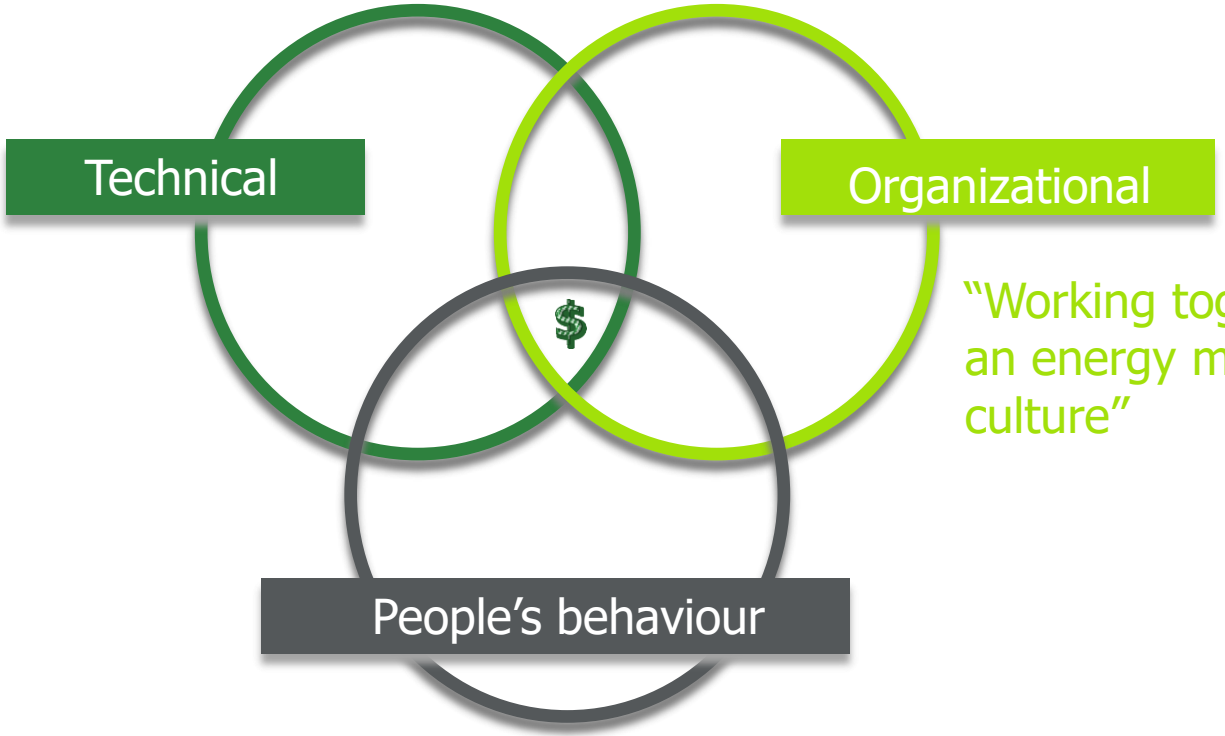


The challenge of energy management (3)



"Awareness, better habits, procedures and feedback"

The challenge of energy management (4)



"Working together to build an energy managing culture"

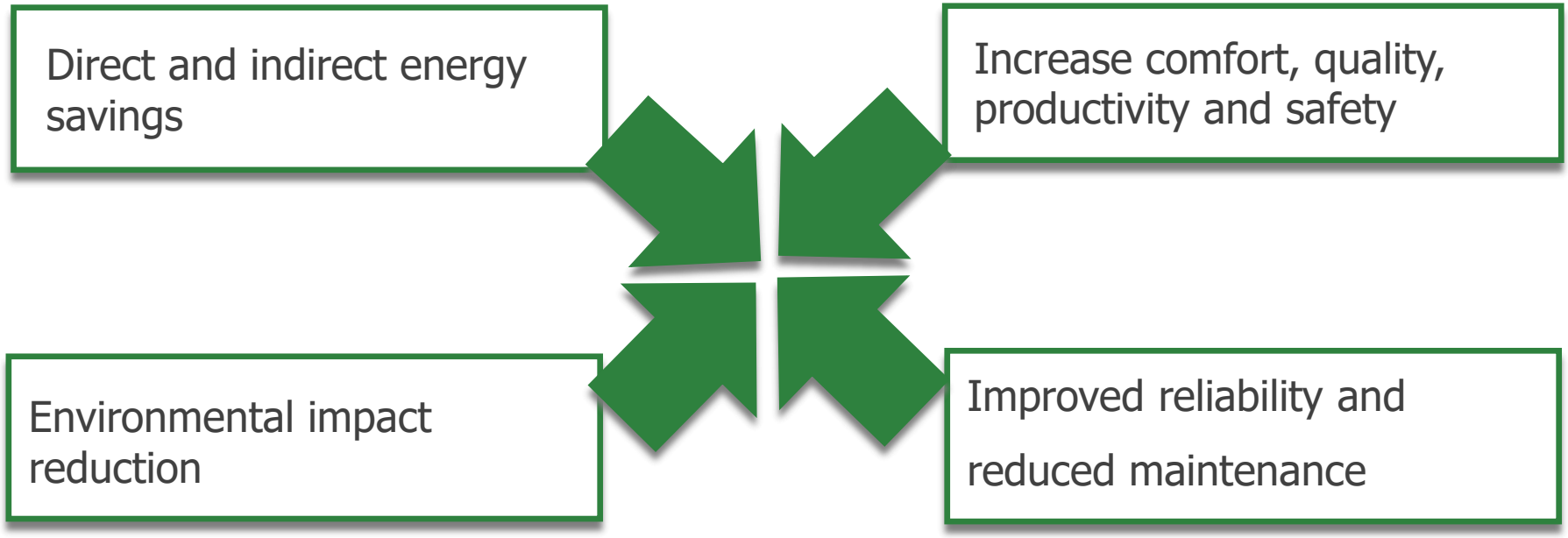
The challenge of energy management (5)

"Operational and/or technologies changes"

"Working together to build an energy managing culture"

"Awareness, better habits, procedures and feedback"

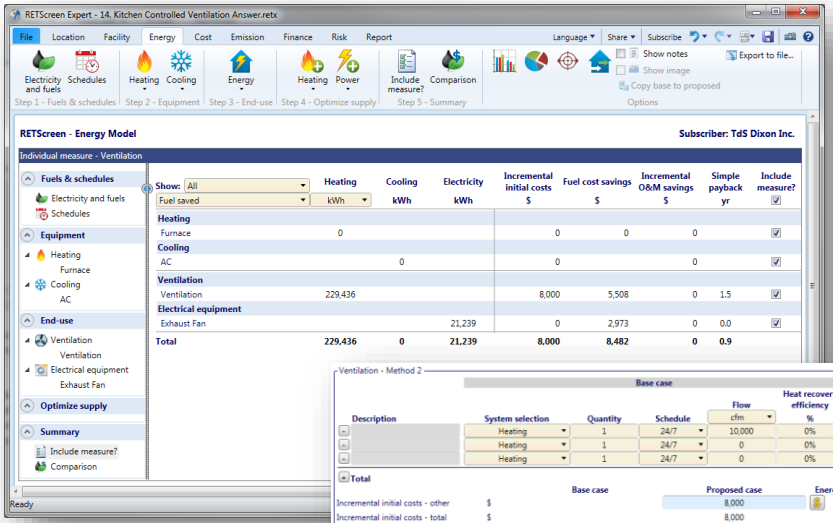
Energy management benefits



Financial analysis of energy savings – the business case for investment

Business case that gets approved

properly quantifying the energy, cost and carbon benefit



www.retscreen.net

Photo: https://en.wikipedia.org/wiki/Heating,_ventilation,_and_air_conditioning

A simple enough question

An energy project costing $900 and yielding electricity savings of $300 per year

An energy project costing $1,500 and yielding electricity savings of $500 per year

Question:

Which is the better project?

Key parameters

- Capital cost
  - One time or phased (re-fit)
- Savings
  - energy and other
- Time horizon
  - The period over which the project will deliver value
- Discount rate
  - Minimum rate of return required by investor
  - Weighted average cost of capital
  - Higher risk tends to increase discount rate
- Inflation rate
  - Energy and other

Essential formulas

Conventionally future amounts are compared (apples to apples) with Present Value

$$\text{Present Value} = \frac{\text{Future Amount}}{(1+ \text{Discount Rate})^{\text{years}}}$$

Future savings are typically determined by inflating present savings

$$\text{Future Amount} = \text{Present Savings } (1+ \text{Inflation Rate})^{\text{years}}$$

Results formulas

Savings to investment ratio

$$\frac{\text{Sum of the PV of Cash Inflows (Savings)}}{\text{PV of Cash Outflows (Investment)}}$$

Net present value

Sum of the PV of Cash Inflows (Savings)
- PV of Cash Outflows (Investment)

Complex formulas (spreadsheet functions)

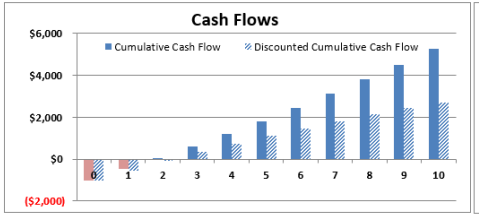
- Internal Rate of Return (IRR)
  - The discount rate that makes the NPV zero.
  - Assumes cash re-invested at project rate of return – likely high
- Modified Internal Rate of Return (MIRR)
  - Considers both the cost of the investment and the interest received on reinvestment of cash.
  - Assumes a more modest interest on reinvestment
  - A more conservative result.

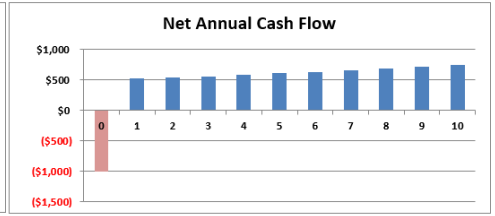
Let’s walkthrough a financial analysis

Energy Project Life Cycle Cash Flow Analysis

Year of Project		0	1	2	3	4	5	6	7	8	9	10
Project Costs		$1,000										
Inflation Rate	4.0%											
Annual Project Savings		$500	$500	$500	$500	$500	$500	$500	$500	$500	$500	$500
Savings with Inflation			$520	$541	$562	$585	$608	$633	$658	$684	$712	$740
Net Cash Flow		($1,000)	$520	$541	$562	$585	$608	$633	$658	$684	$712	$740
Cumulative Cash Flow		($1,000)	($480)	$61	$623	$1,208	$1,816	$2,449	$3,107	$3,791	$4,503	$5,243
Discount Rate	10.0%											
Present Value (PV) of Net Cash Flow		($1,000)	$473	$447	$423	$400	$378	$357	$338	$319	$302	$285
Cumulative PV of Net Cash Flow		($1,000)	($527)	($80)	$342	$742	$1,119	$1,477	$1,814	$2,133	$2,435	$2,721

Financial Metrics		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Simple Payback	2.0 yrs										
Internal Rate of Return	IRR	-48.0%	4.0%	28.3%	40.3%	46.7%	50.3%	52.4%	53.7%	54.5%	55.0%
Modified Internal Rate of Return	MIRR	-48.0%	5.5%	21.3%	26.4%	27.8%	27.9%	27.5%	26.9%	26.2%	25.4%
Net Present Value	NPV	($527)	($80)	$342	$742	$1,119	$1,477	$1,814	$2,133	$2,435	$2,721
Savings to Investment Ratio	SIR	0.5	0.9	1.3	1.7	2.1	2.5	2.8	3.1	3.4	3.7





Financing Rate (for MIRR)	10.0%
Re-Investment Rate (for MIRR)	10.0%

Costs and savings (inflated)

Year of Project		0	1	2	3
Project Costs		$1,000			
Inflation Rate	4.0%				
Annual Project Savings		$500	$500	$500	$500

Future Amount = Present Savings $(1+ \text{Inflation Rate})^{\text{years}}$

Year of Project		0	1	2	3
Project Costs		$1,000			
Inflation Rate	4.0%				
Annual Project Savings		$500	$500	$500	$500
Savings with Inflation			$520	$541	$562

Present value of net cash-flow

Year of Project		0	1	2	3
Project Costs		$1,000			
Inflation Rate	4.0%				
Annual Project Savings		$500	$500	$500	$500
Savings with Inflation			$520	$541	$562
Net Cash Flow		($1,000)	$520	$541	$562

$$\text{Present Value} = \frac{\text{Future Amount}}{(1+\text{Discount Rate})^{\text{years}}}$$

Discount Rate	10.0%				
Present Value (PV) of Net Cash Flow		($1,000)	$473	$447	$423
Cumulative PV of Net Cash Flow		($1,000)	($527)	($80)	$342

Net present value (cumulative discounted cash-flow)

Cumulative Cash Flow		($1,000)	($480)	$61	$623
Discount Rate	10.0%				
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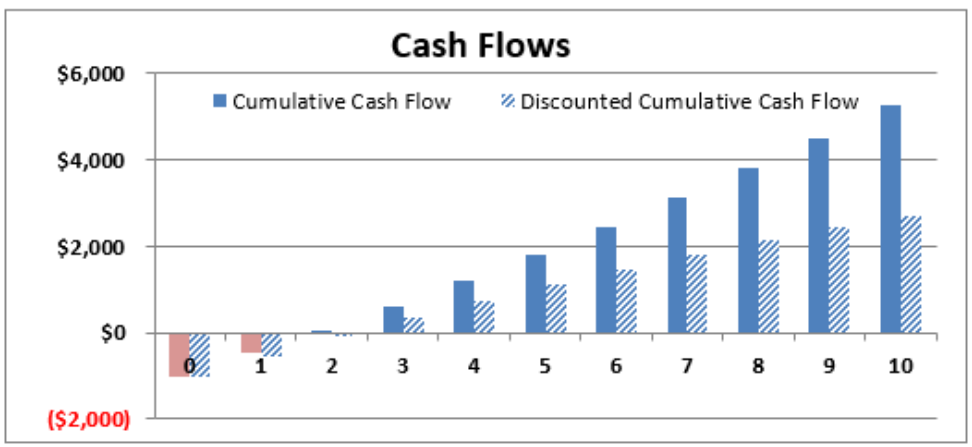

Financial metrics (better and common)

Financial Metrics		Year 1	Year 2	Year 3
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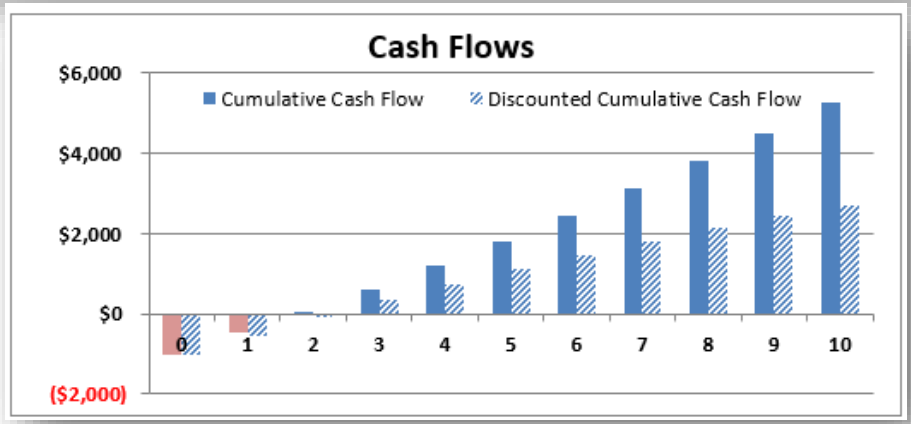

Now let's stretch the horizon!

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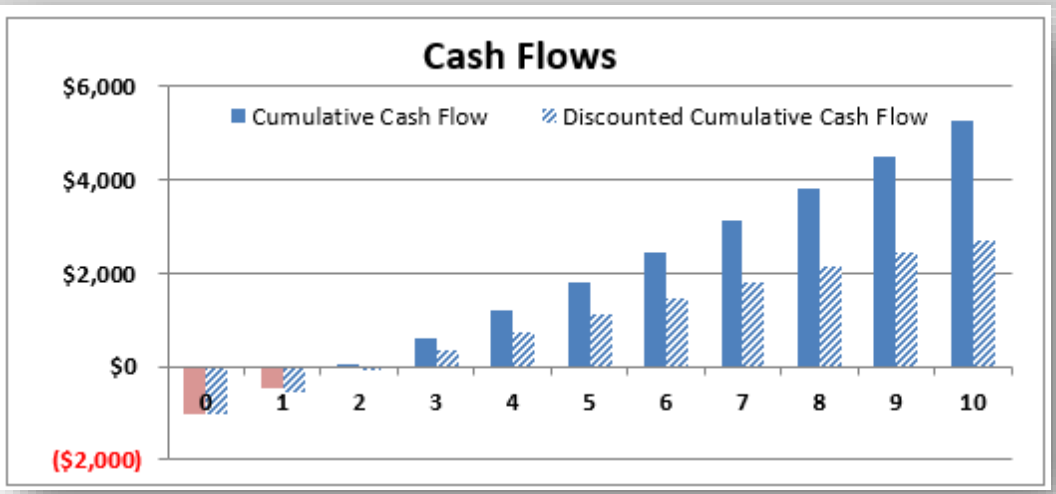

The whole picture

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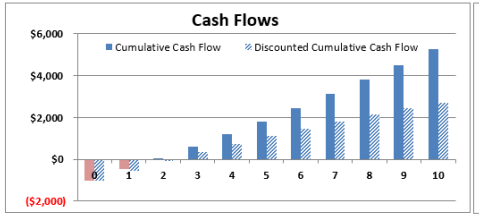

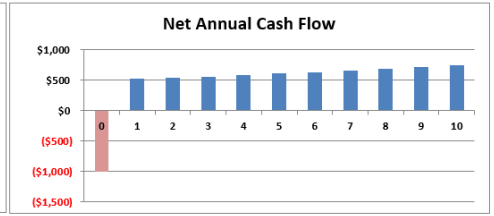

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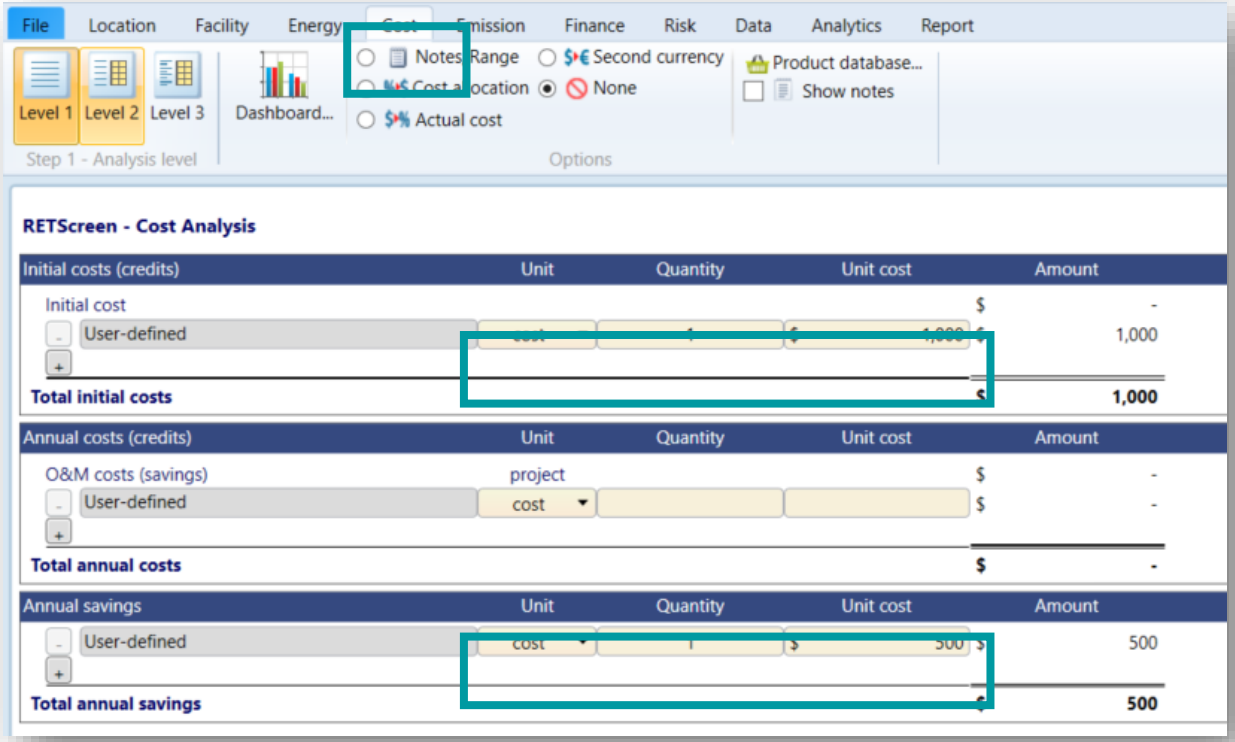
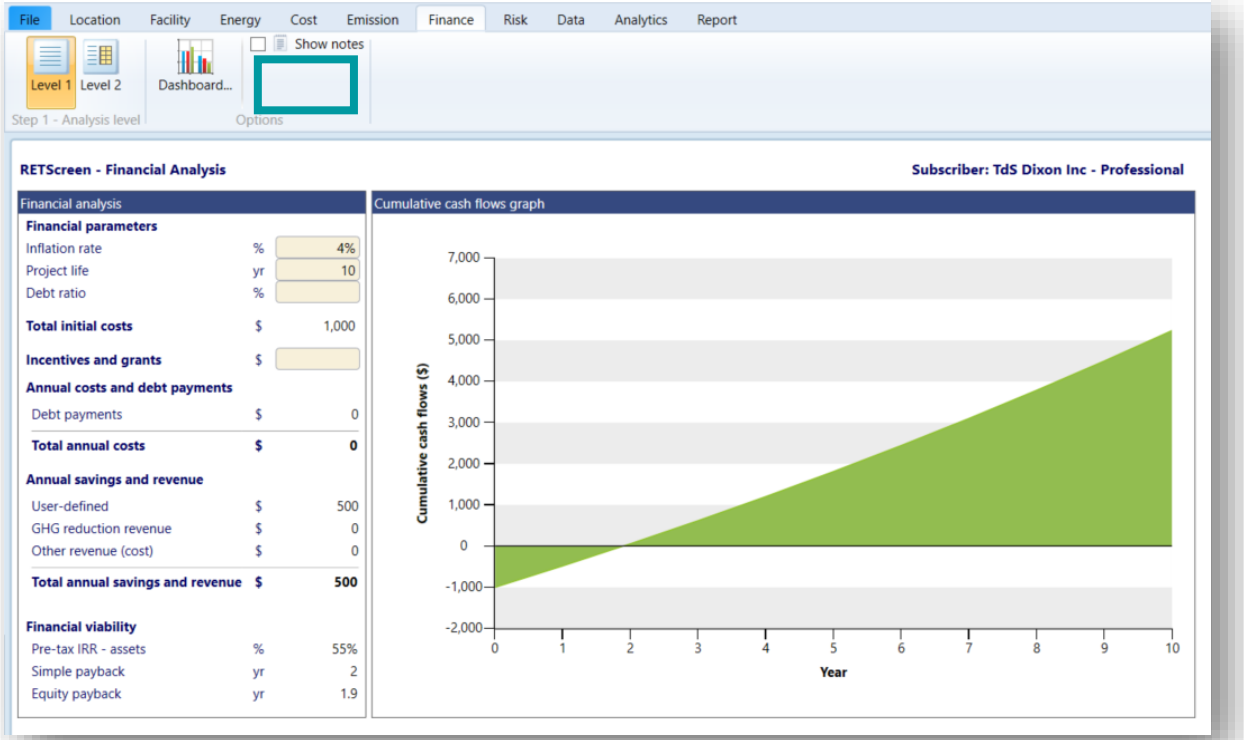
Entering costs and savings



Level one: financial analysis

entering values to match spreadsheet



Level two: financial analysis

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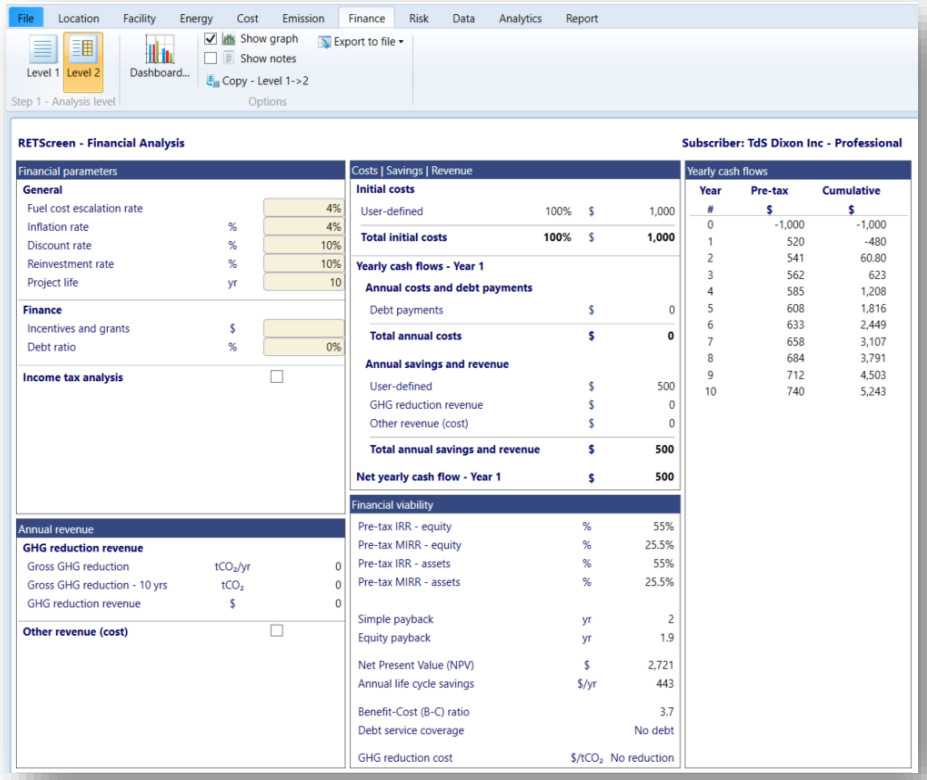

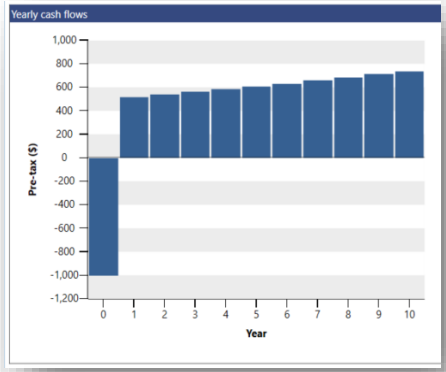

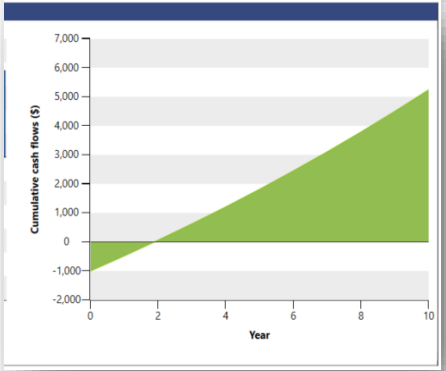

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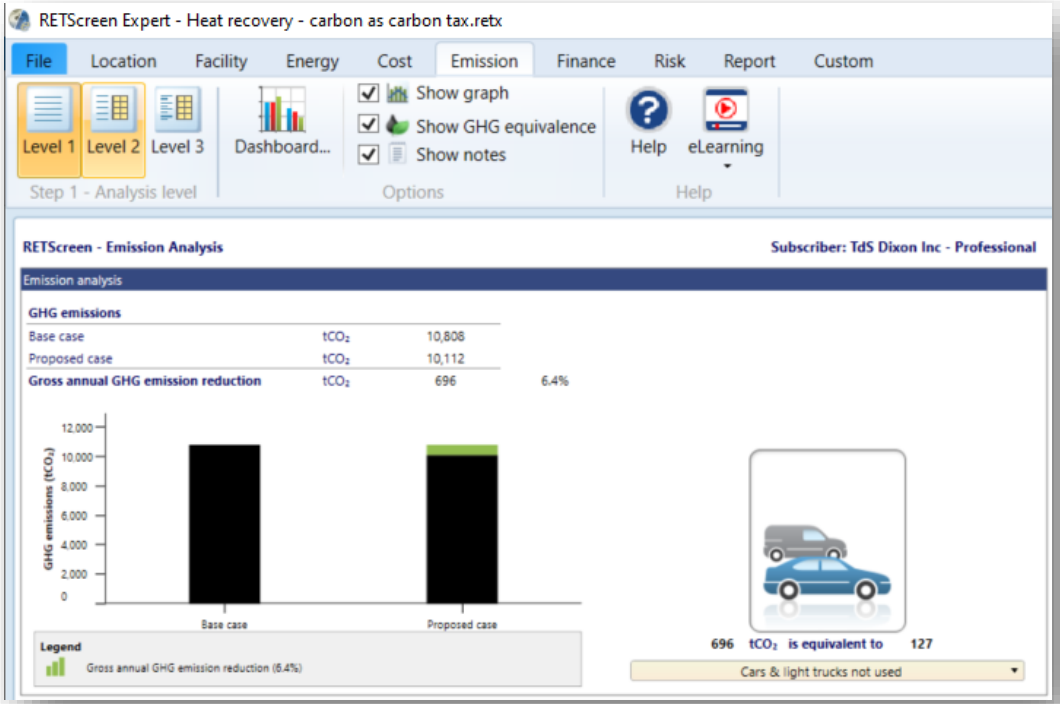
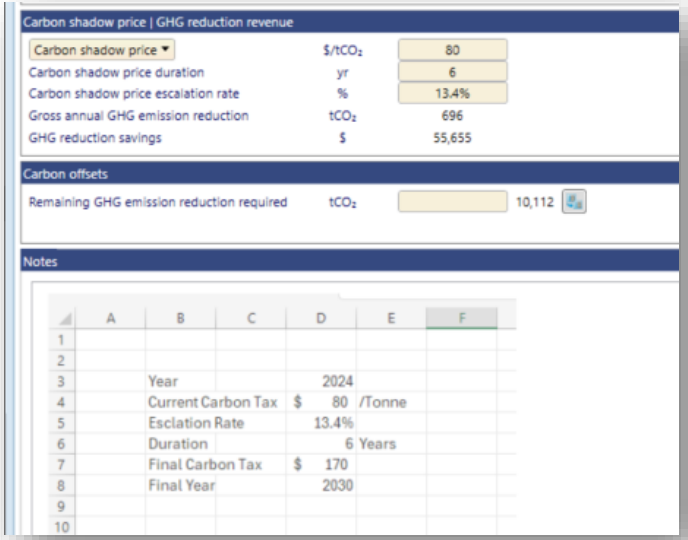
SAVE ON ENERGY
POWER WHAT'S NEXT

Pulling it all together

Usng RETScreen's features for carbon





Homework: give it a try!

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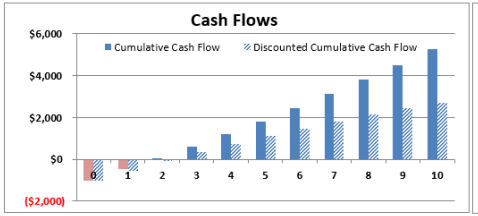

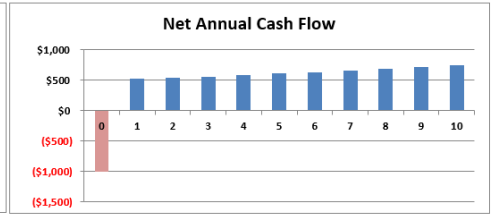

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Stay connected with tools and resources

- Virtual one-on-one coaching: post-webinar support intake form for tailored support for organizations to manage energy resources effectively
- Monthly bulletin: sign up to receive monthly training updates on all Save on Energy training and support new tools and resources
- Live training calendar: visit this page to easily register for upcoming events and workshops
- Training and support webpage: visit this page to access all training and support materials

Post-Webinar Support

One-on-one coaching: tailored support for managing energy resources effectively

Post-webinar support intake form

Coaching sessions conducted virtually: phone, video calls, and email

Designed for organizations, new or old, seeking guidance.

Thank you!

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