

GRF = Green Revolving Fund Your Facility's Savings Account

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Introduction

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Agenda

1. GRF Concept and History
2. How GRFs Help Schools Win
3. Lessons Learned
4. How to Start a GRF

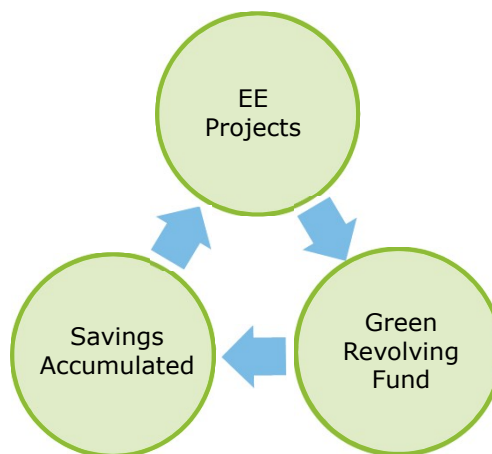
GRF Concept and History

Project Process – Typical



Savings absorbed (lost)

Project Process – GRF



GRF History

Western Michigan University

GRF #1: 47% ROI since 1980

GRF #2: 16% ROI since 2012



Harvard University

\$12M Fund: Average project returns of 30% per year, saves \$4.8M annually



Your School

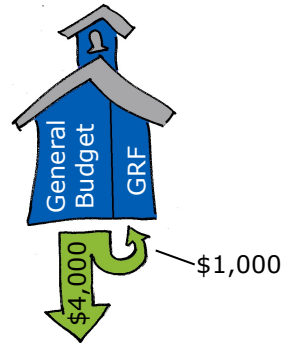
How GRFs Help Schools Win

Before Project



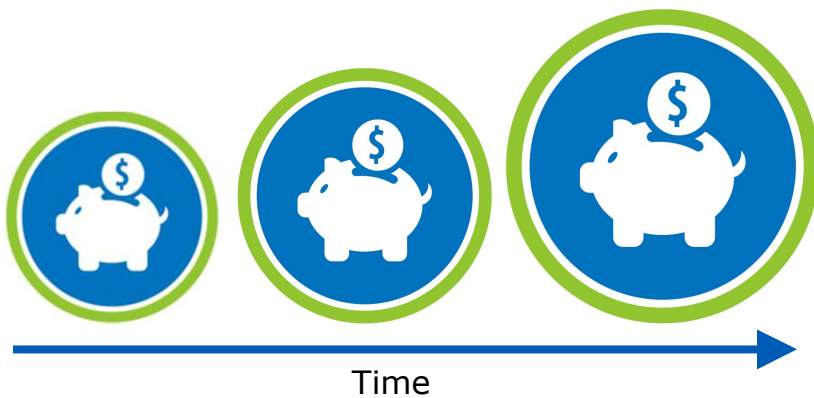
Utility

After Project



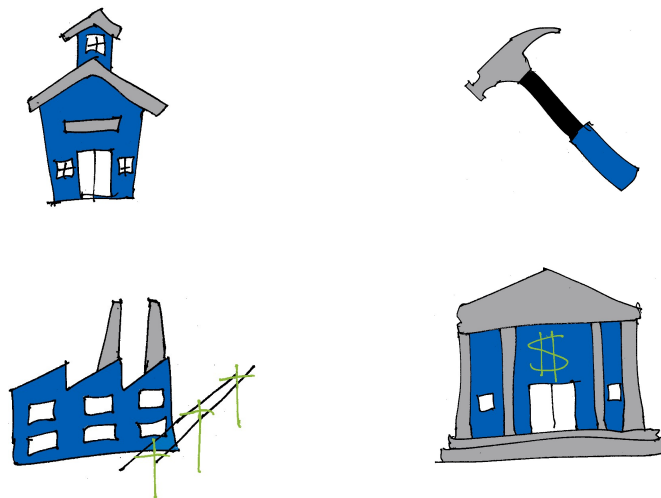
Utility

Your District Savings Account



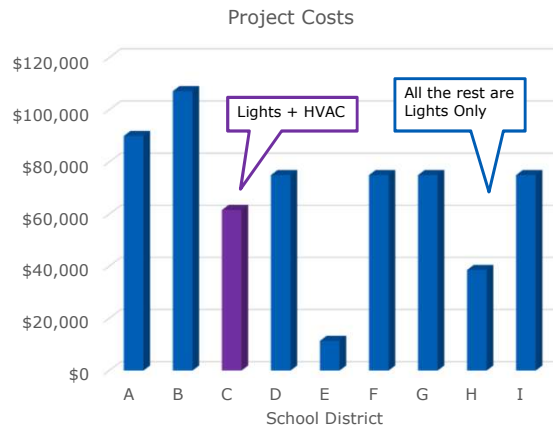
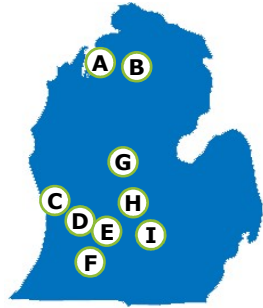
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Example Cash Flow

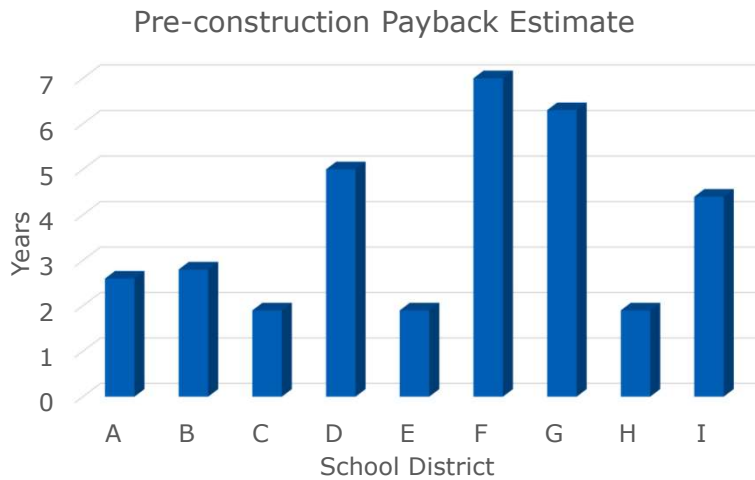


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Pilot Projects

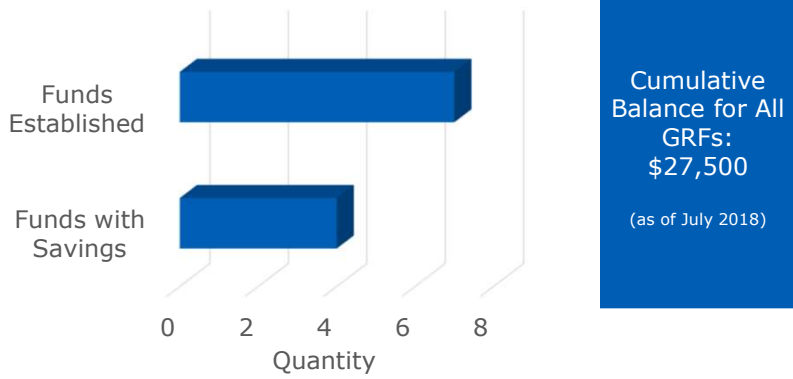


Pilot Projects Payback



Status of Pilot GRFs

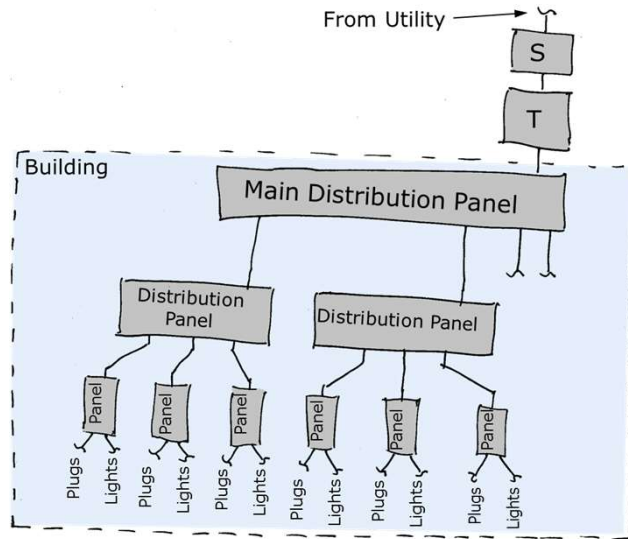
Michigan Green Revolving Funds



Lessons Learned

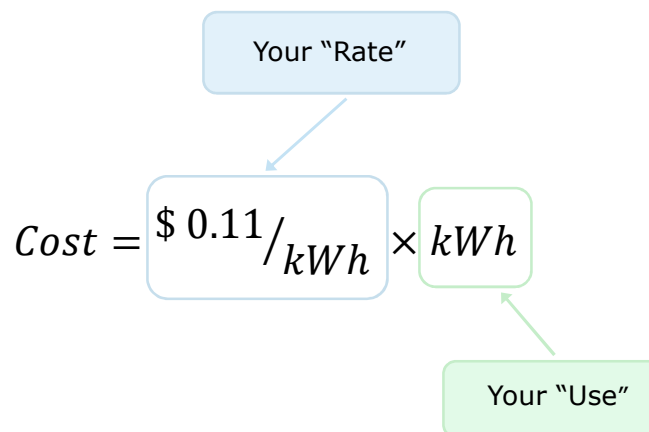


Measurement and Verification



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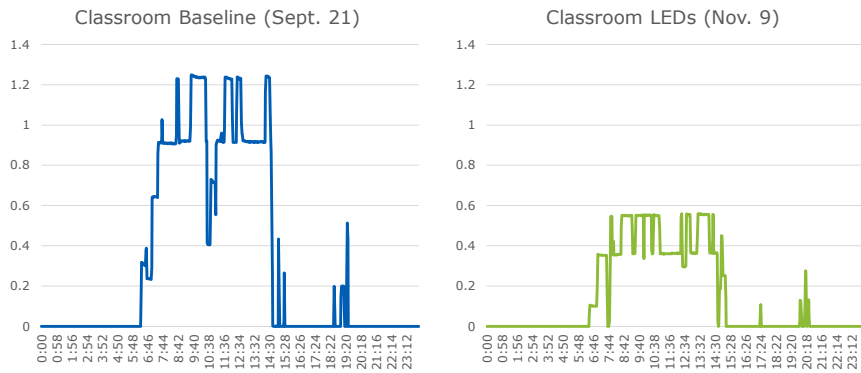
Savings



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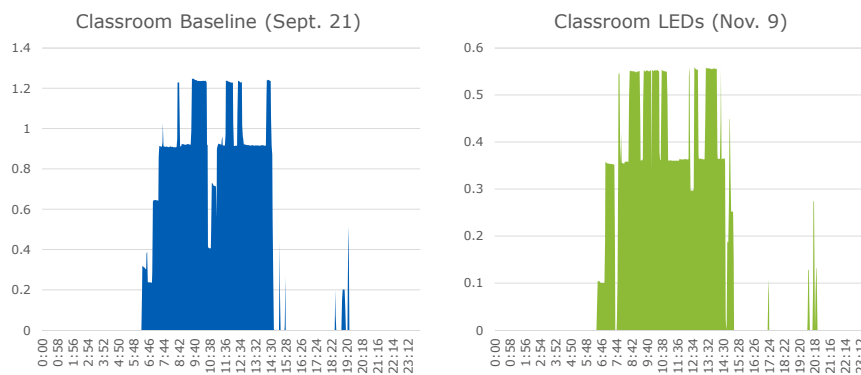
Results - Kilowatts

Peak reduction is clear and dramatic

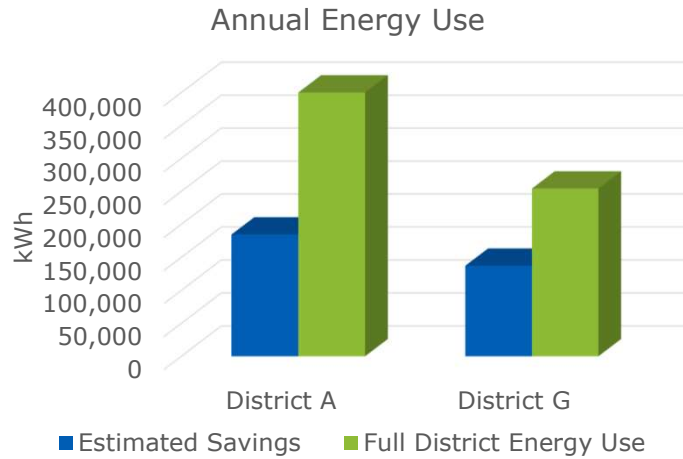


Results - Kilowatt-hours

Independent of peak reduction, "Hours of Use" may have increased



Estimated Energy Savings



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Lighting Savings Calculation

$$\text{Energy Use (kWh)} = (\text{Wattage}) \times (\text{hours_of_use})$$



October 2017							November 2017								
Su	Mo	Tu	We	Th	F	Sa	Su	Mo	Tu	We	Th	F	Sa	Su	
1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9
8	9	10	11	12	13	14	8	9	10	11	12	13	14	15	16
15	16	17	18	19	20	21	15	16	17	18	19	20	21	22	23
22	23	24	25	26	27	28	22	23	24	25	26	27	28	29	30
29	30	31					29	30	31						

January 2018							February 2018							
Su	Mo	Tu	We	Th	F	Sa	Su	Mo	Tu	We	Th	F	Sa	Su
1	2	3	4	5	6	7	1	2	3	4	5	6	7	
8	9	10	11	12	13	14	8	9	10	11	12	13	14	
15	16	17	18	19	20	21	15	16	17	18	19	20	21	
22	23	24	25	26	27	28	22	23	24	25	26	27	28	
29	30	31					29	30	31					

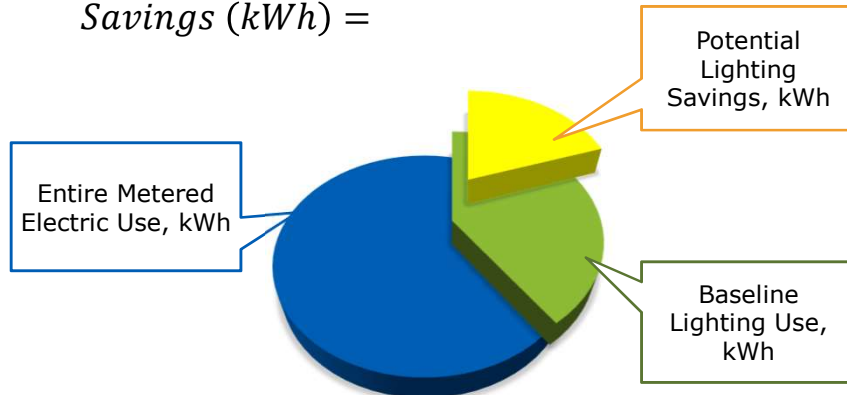
April 2018							May 2018							
Su	Mo	Tu	We	Th	F	Sa	Su	Mo	Tu	We	Th	F	Sa	Su
1	2	3	4	5	6	7	1	2	3	4	5	6	7	
8	9	10	11	12	13	14	8	9	10	11	12	13	14	
15	16	17	18	19	20	21	15	16	17	18	19	20	21	
22	23	24	25	26	27	28	22	23	24	25	26	27	28	
29	30	31					29	30	31					

$$\text{Savings (kWh)} = (\text{Watt_Change}) \times (\text{hours_of_use})$$

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Does Savings Amount Make Sense?

Savings (kWh) =



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Common Sense Calculations

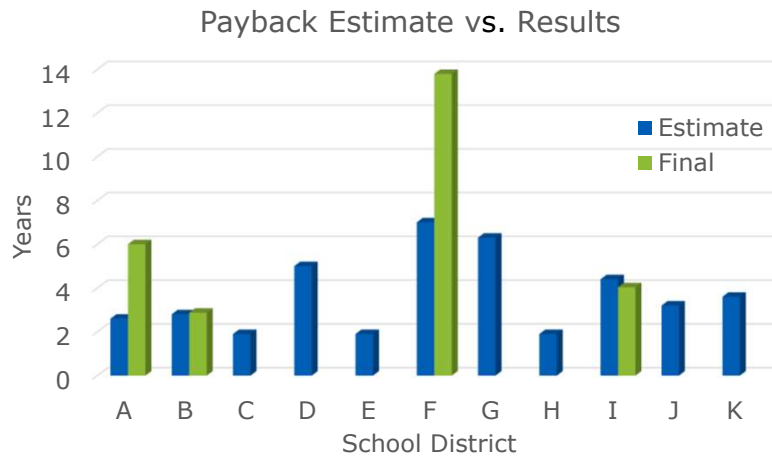
Savings - Estimate Feasibility Check

$$\text{Savings (kWh)} = (\text{Use}) \times (\% \text{Building}) \times (\% \text{Lights}) \times (\Delta W)$$

- *Use* = Annual utility meter kWh
- *%Building* = proportion of project area to utility meter service area
- *%Lights* = _____% of all electric uses in project area
- *ΔW* = typically approx. ___% for LED from metal halide or fluorescent

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Pilot Financial Outcomes



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How to Start One for Yourself

Local Resources:

Consumers Energy - ConsumersEnergy.com/startsaving
Ecology Center - ecocenter.org

National Authority on GRFs:

Sustainable Endowments Institution - endowmentinstitute.org
greenbillion.org



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Thank You



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