

APRIL 22, 2016

ENERGY EFFICIENCY IN MICHIGAN K-12 SCHOOLS

SURVEY AY 2015-16



**MICHIGAN RENEWABLE
SCHOOLS PROGRAM**

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**ECOLOGY
CENTER**

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EXECUTIVE SUMMARY

In January 2016, the Ecology Center released a survey targeting feedback from K-12 school administrators and facilities directors. The intent was to assess current needs and opportunities related to increasing investments in energy efficiency in K-12 school facilities. The survey was promoted through partner channels and existing networks (including the Michigan School Business Officials), and was intended to illuminate specific resources and tools that K-12 school communities identify as necessary in moving energy projects forward in their school/districts.

The respondents represent **over 400 instructional facilities and 100 additional non-instructional facilities**. These facilities are estimated to total 30-50M SF of institutional space, or \$50M in estimated annual utility costs.

KEY FINDINGS

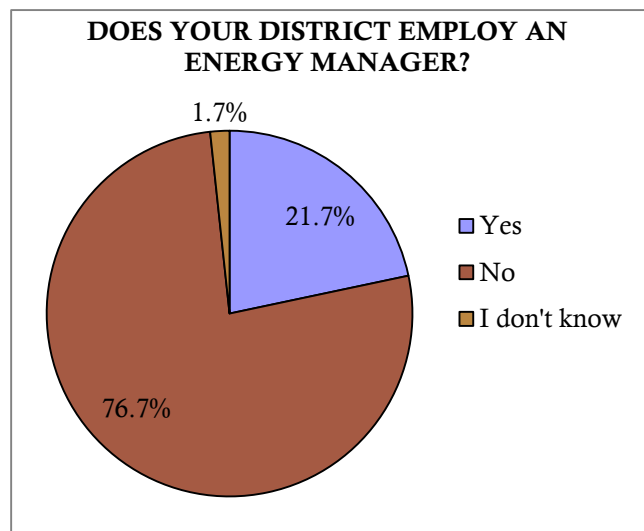
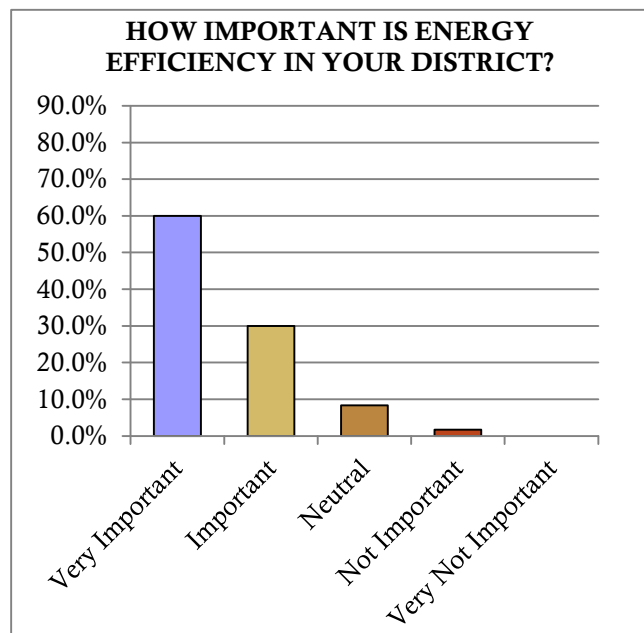
A large percentage of respondents indicated that energy efficiency is important (90%) in their school/district.

80% also indicated they are tracking energy usage at their schools. However, more than half of respondents are using Excel based spreadsheets or just monitoring utility bills on a monthly basis. A small percentage (15%) were taking advantage of ENERGY STAR Portfolio Manager while a number of other schools indicated they were using EnergyCAP or some other proprietary solution for tracking.

Only 22% of respondents indicated their school/district employed an Energy Manager, or personnel whose primary responsibility is energy management.

When asked specifically about the barriers that exist in moving projects forward, respondents most frequently responded that a “limited budget” and a “lack of funding” were very problematic, with lack of “expertise on staff” and “lack of staff to implement” also identified as problematic.

Most schools seem to prefer to handle projects internally or work collaboratively with outside professional organizations to execute projects. When asked how projects were implemented at their school/district, only one (1) respondent selected “outside professional organization” as a sole solution provider. This is consistent with feedback captured from 2009-11 and is important to consider when developing solutions for this market sector.



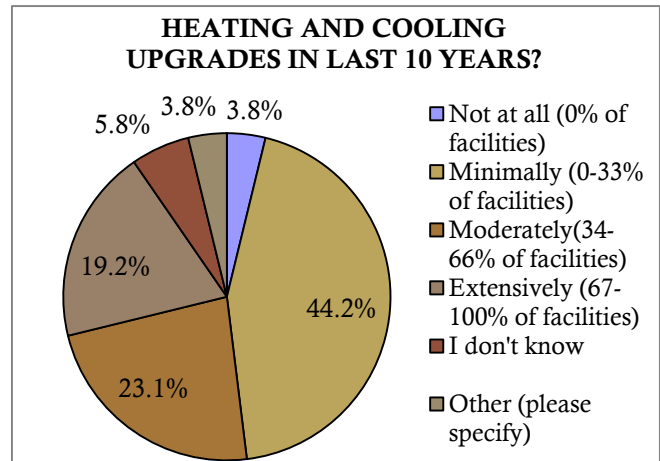
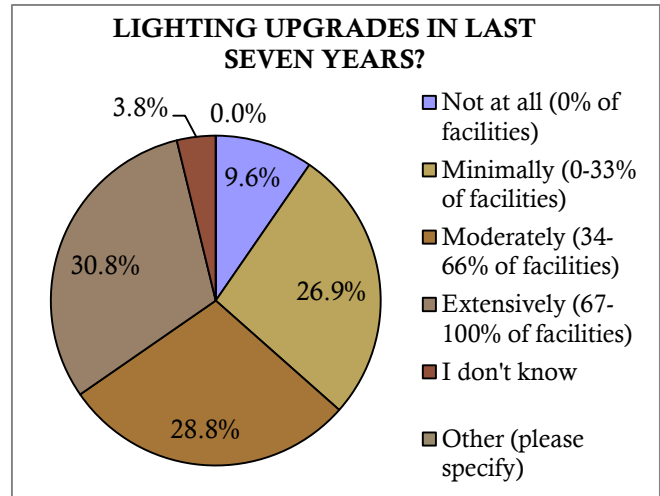
More than a third of respondents have done minimal to no lighting upgrades, while nearly 50% of respondents have not upgraded heating and cooling plants in the last ten (10) years – and likely longer. Other opportunities appear to exist related to ventilation systems, commissioning, behavioral management and water conservation. These represent significant dollar savings potential.

Overall, the school/district respondents sent a clear message: funding is a critical need for moving projects forward. Additionally, technical engineering and financing education and tools seem to be important components to implementing energy efficiency and renewable energy projects. Extra incentive funding and assistance can move a project in front of “other more pressing needs.”

A recurring theme was the need for increased access to incentives/grants and low-cost funding. When asked about preferred interest rates and length of financing terms, school/districts identified 0-2% financing packages with a 3-5 year simple payback window as a highly rated finance solution.

In general, schools expressed a strong interest in energy efficiency, and indicated that assistance – either in the form of funding or technical engineering/project assistance – would be beneficial to getting projects done. Additionally, they expressed interest in a collaborative engagement that allowed schools to maximize the savings to their district and reduce maintenance and operating costs. They understand that there is monetary value and savings to be had from implementing efficiency measures in their schools.

Finally, the interest level appears to remain strong in participating in a statewide energy program for K-12 schools. Over 80% of respondents expressed interest in participating in technical energy and financing program. The list of school/districts responding to the survey are identified in the Appendix.



SURVEY RESULTS

BACKGROUND

In January 2016, the Ecology Center released a survey targeting feedback from K-12 school administrators and facilities directors on current needs and opportunities related to increasing investments in energy efficiency in K-12 school facilities. This needs assessment, promoted through partner channels and existing networks (including the Michigan School Business Officials), intended to uncover some specific resources and tools that K-12 school communities identify as necessary to move projects forward in their school/districts.

Our team had additional objectives: a) announce the return of the Michigan Renewable Schools Program, operated by a subsidiary of the Ecology Center from 2009-11, and b) begin to develop a pipeline for candidates to participate in a revised and reconceived energy efficiency initiative.

QUESTIONS AND RESPONSES

The following questions and responses were issued and feedback received in January of 2016. Respondents were asked 34 questions in total. A subset of typed (custom) responses to questions 1 and 2 are included in the appendix.

DEMOGRAPHICS AND BACKGROUND

We received 60 responses to the survey (57 unique respondents), with most respondents being Business Managers, Facility Directors, or Operations Directors. A limited number of educators (particularly science faculty) responded on behalf of their school/district.

Over 60% of respondents indicated that they were familiar with the Michigan Renewable Schools Program.

The respondents represent **over 400 instructional facilities and 100 additional non-instructional facilities**. These facilities are estimated to total 30-50M SF of institutional space, or \$50M in estimated annual utility costs.

QUESTION 1 – WHAT SCHOOL/DISTRICT DO YOU REPRESENT?

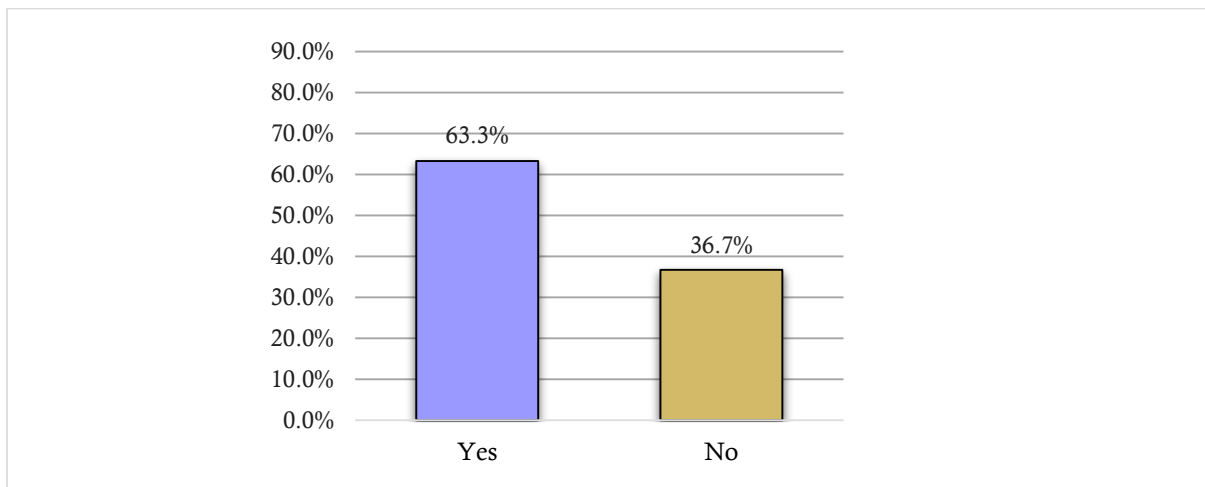
Respondents included a large percentage of public school/districts and a small percentage of independent, and public charter academies (see Appendix).

QUESTION 2 – WHAT IS YOUR POSITION/TITLE?

The majority of the respondents were primarily responsible for facilities and operations within their school/districts. However, respondents also included less than 10% of teachers or other school community professionals (see Appendix).

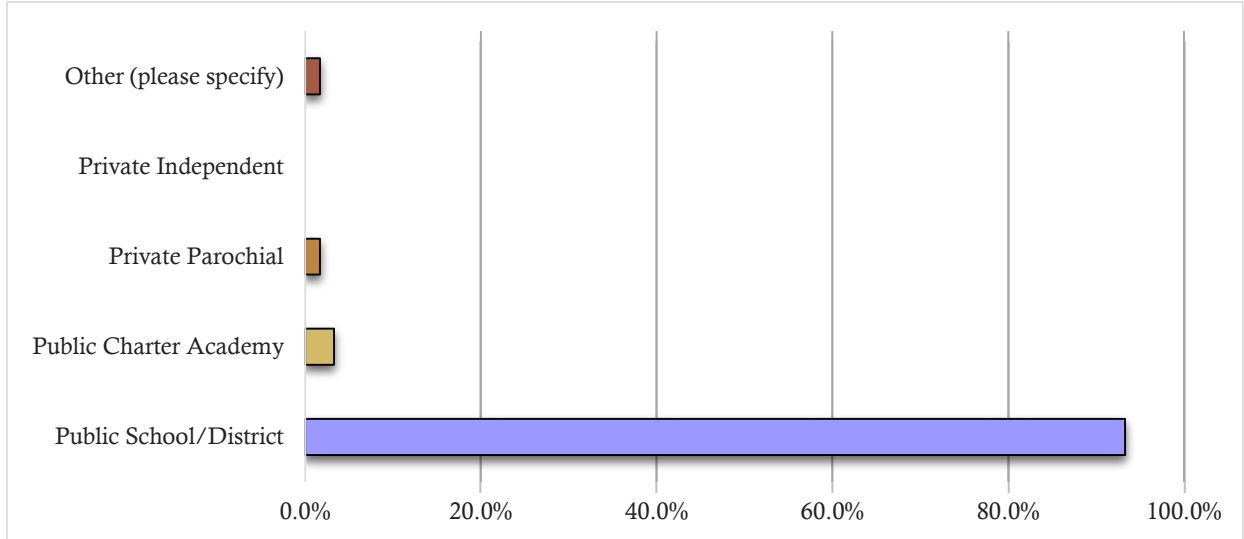
QUESTION 3 - ARE YOU FAMILIAR WITH THE MICHIGAN RENEWABLE SCHOOLS PROGRAM, ADMINISTERED BY ENERGY WORKS MICHIGAN, WHICH IMPLEMENTED ENERGY EFFICIENCY AND RENEWABLE ENERGY PROJECTS IN 67 SCHOOLS/DISTRICTS FROM 2009-2011?

38 out of 60 respondents were familiar with the Michigan Renewable Schools Program. Of the 38 who were familiar with the program, only 42% (16 respondents) participated or had or enrolled in the previous generation of the program.



QUESTION 4 - WHAT TYPE OF SCHOOL/DISTRICT DO YOU REPRESENT?

Most respondents were public school district representatives. The network channels used to promote and circulate the survey likely factored into this distribution.



QUESTION 5 – HOW MANY INSTRUCTIONAL FACILITIES ARE IN YOUR SCHOOL/DISTRICT?

One in four respondents operated a district with 10 buildings or more. Only 4 total respondents operated a single instructional facility.

Number of instructional facilities reported by respondents	
Highest	30
Mean	7.29
Median	6
Lowest	1

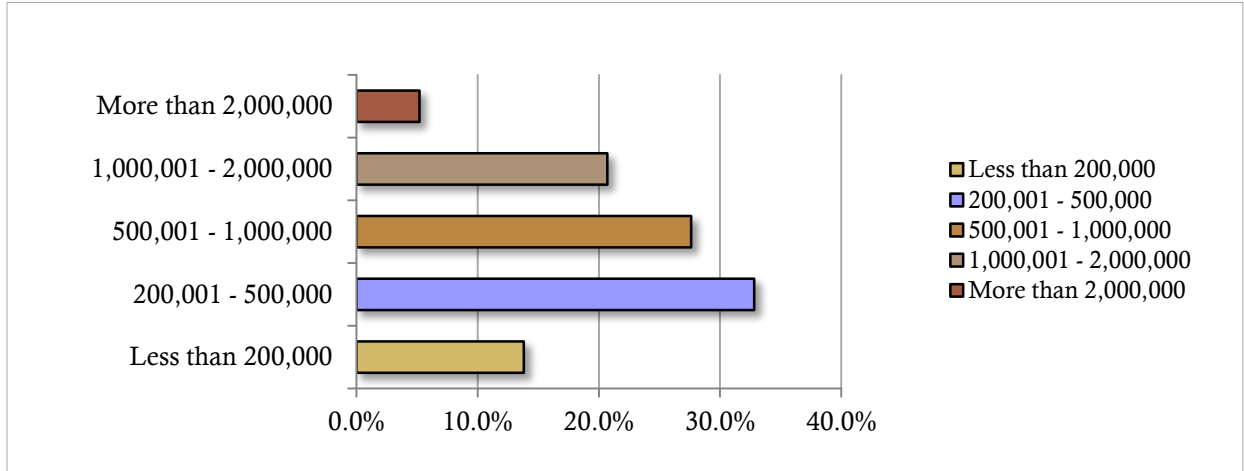
QUESTION 6 – HOW MANY NON-INSTRUCTIONAL FACILITIES ARE IN YOUR SCHOOL/DISTRICT?

Only one respondent operated 10 or more non-instructional facilities. 65% of respondents operated 2 non-instructional facilities or less.

Number of non-instructional facilities reported by respondents	
Highest	11
Mean	2.27
Median	2
Lowest	0

QUESTION 7 - APPROXIMATELY HOW MANY TOTAL SQUARE FEET OF FACILITIES DO YOU OPERATE?

Most respondents reflected school/districts operating facilities between 200,000 – 2,000,000 square feet.

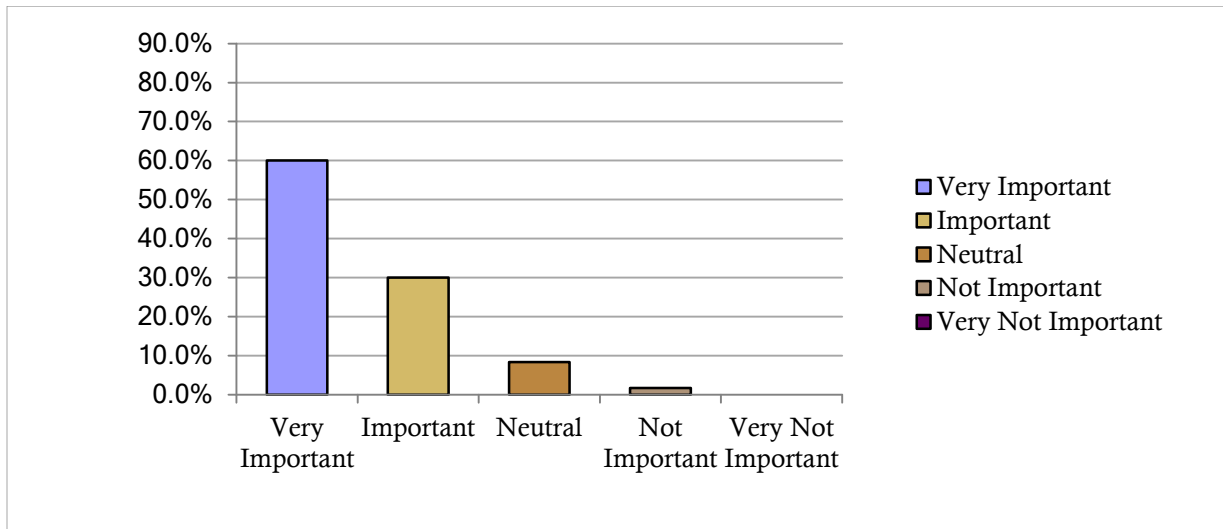


ENERGY TRACKING AND DISTRICT COMMITMENT

The following questions were intended to identify how invested schools currently are in improving the energy efficiency of their school/district facilities. Questions attempt to identify attitudes, school community culture and staffing.

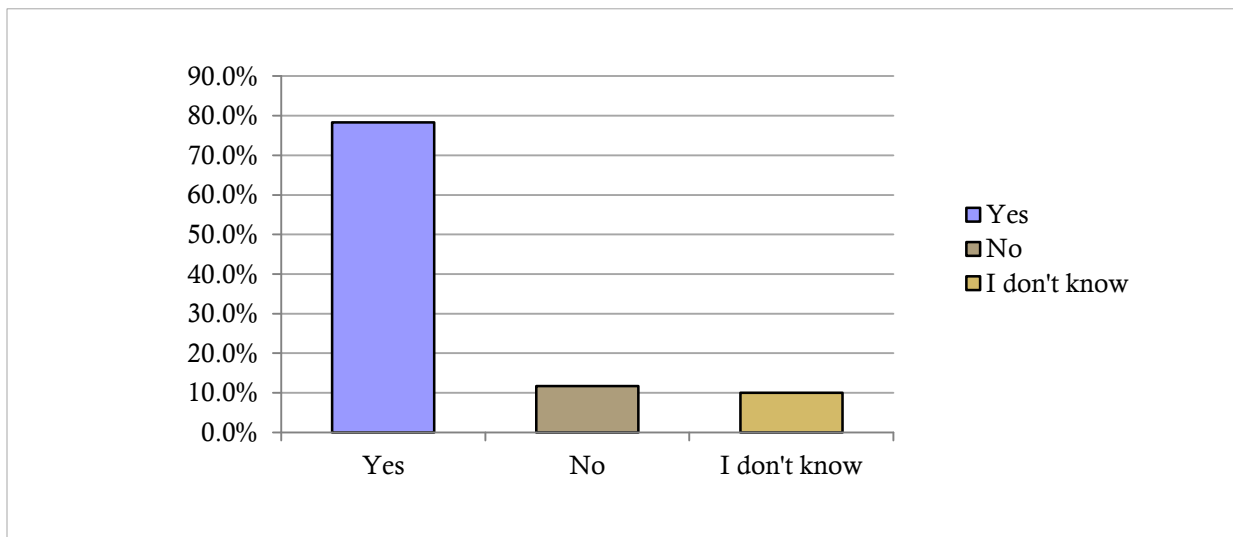
QUESTION 8 - AT YOUR SCHOOL/DISTRICT, HOW IMPORTANT IS ENERGY EFFICIENCY AND CONSERVATION?

90% of the respondents indicated that that energy efficiency is important, with 60% reporting energy efficiency is very important in their school/district.



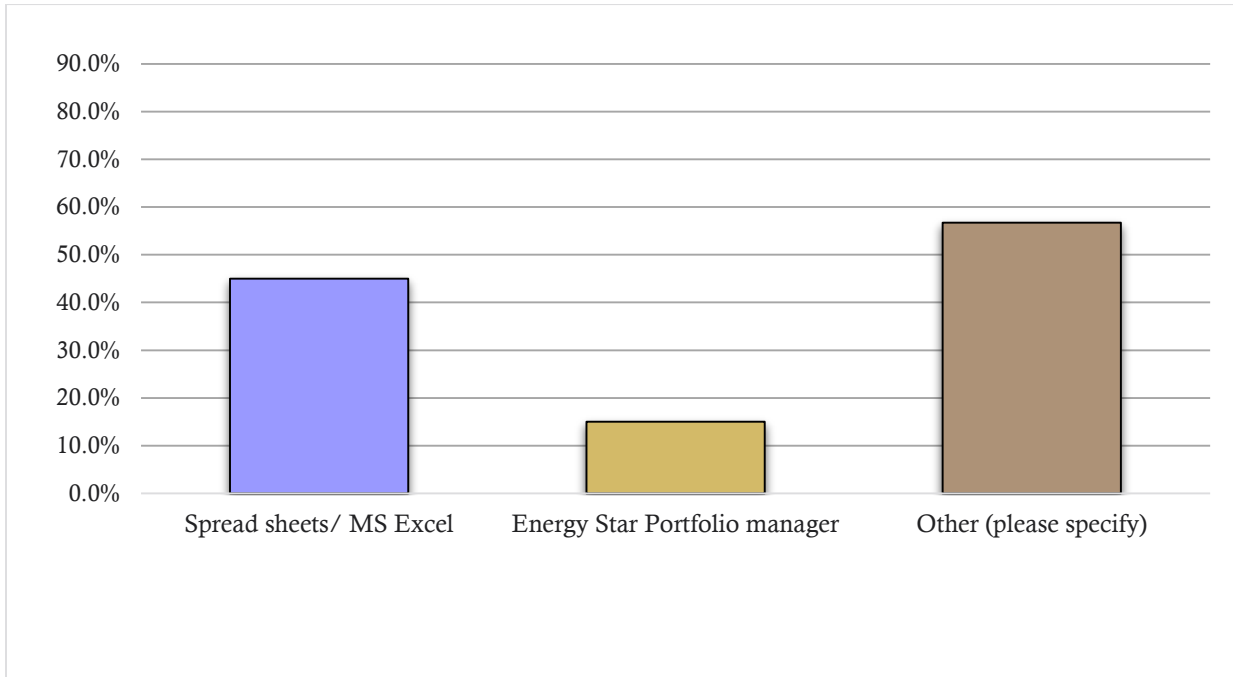
QUESTION 9 - DO YOU MONITOR YOUR ENERGY USAGE AND KEEP RECORDS OF HISTORICAL USAGE?

Nearly 80% of respondents currently monitor energy usage in their school/district.



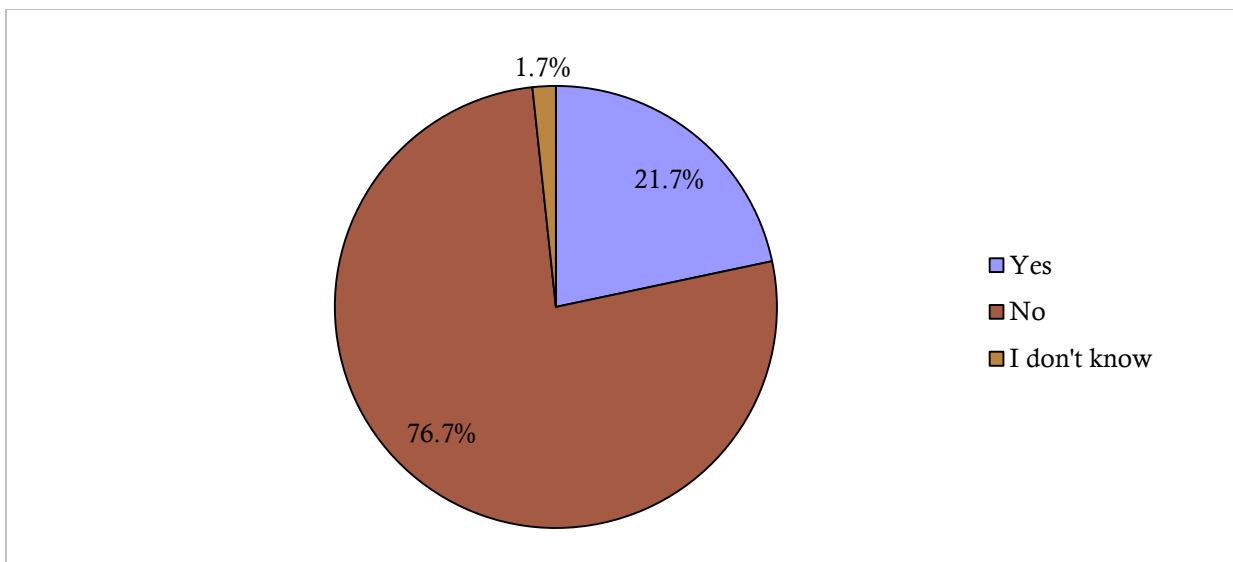
QUESTION 10 - WHAT SYSTEM DO YOU USE TO TRACK ENERGY USAGE?

Two in five respondents used spreadsheets (i.e MS Excel) to track energy usage. 15% of respondents were using ENERGY STAR Portfolio Manager at the time of this survey. Other uses included proprietary software (such as EnergyCAP, School Dude, etc). A small percentage identified using hardcopy reports to track usage.



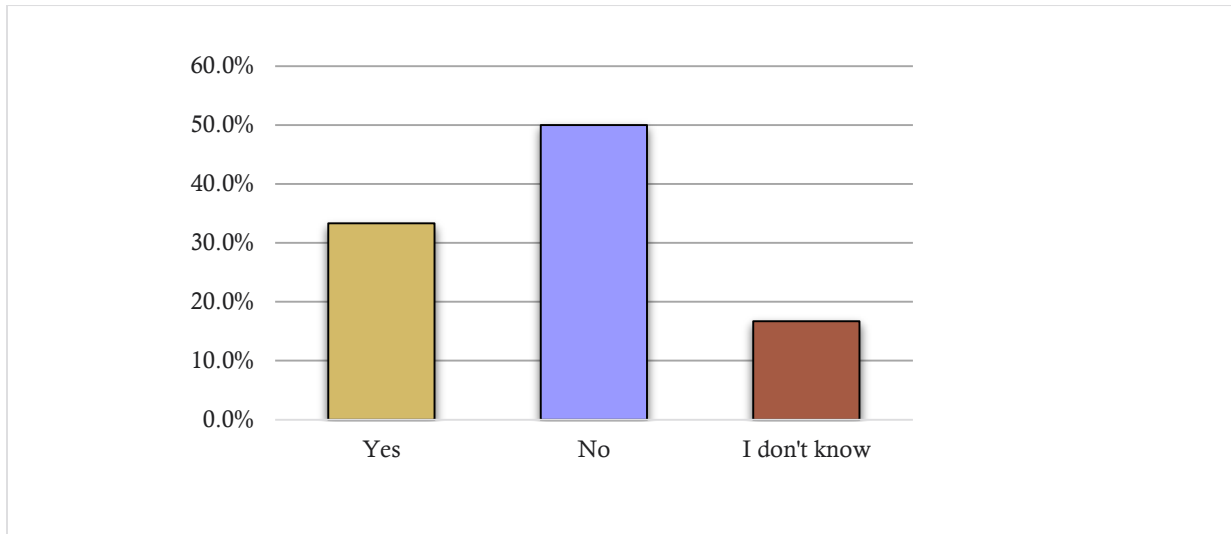
QUESTION 11 - DOES YOUR SCHOOL/DISTRICT EMPLOY A DEDICATED ENERGY MANAGER (PERSONNEL WHOSE PRIMARY RESPONSIBILITY IS ENERGY MANAGEMENT)?

Three out of four school/districts do not employ a dedicated energy manager.



QUESTION 12 - DOES YOUR SCHOOL/DISTRICT HAVE AN INTERNAL STUDENT OR STAFF LED "GREEN TEAM(S)" OR OTHER SUSTAINABILITY INITIATIVES IN PLACE?

More than three in 10 respondents identified having a “green team” or sustainability initiative in place. 50% of school/districts do not report any sustainability initiatives.

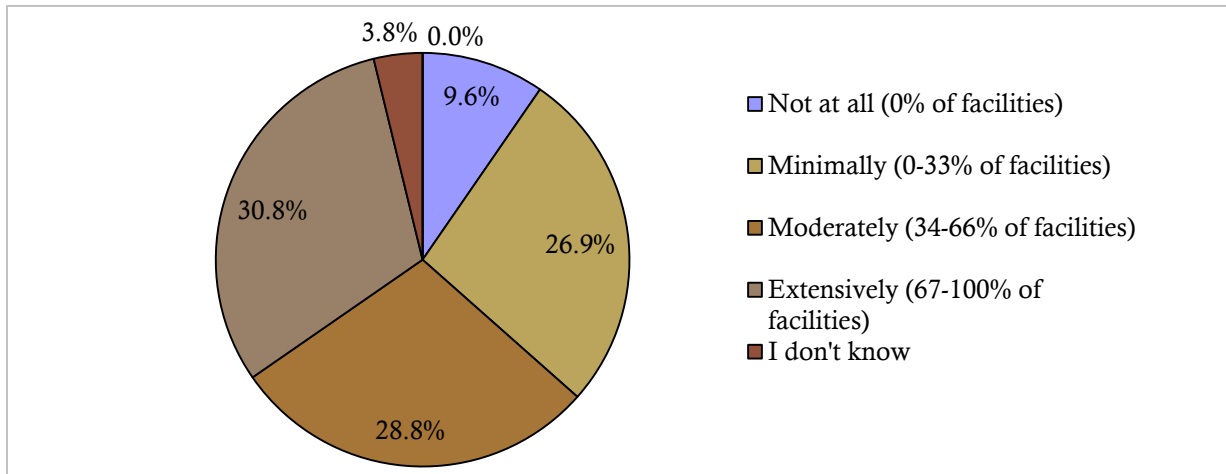


CURRENT INITIATIVES

The following questions attempt to identify what actions schools are currently taking to improve the efficiency of their facilities.

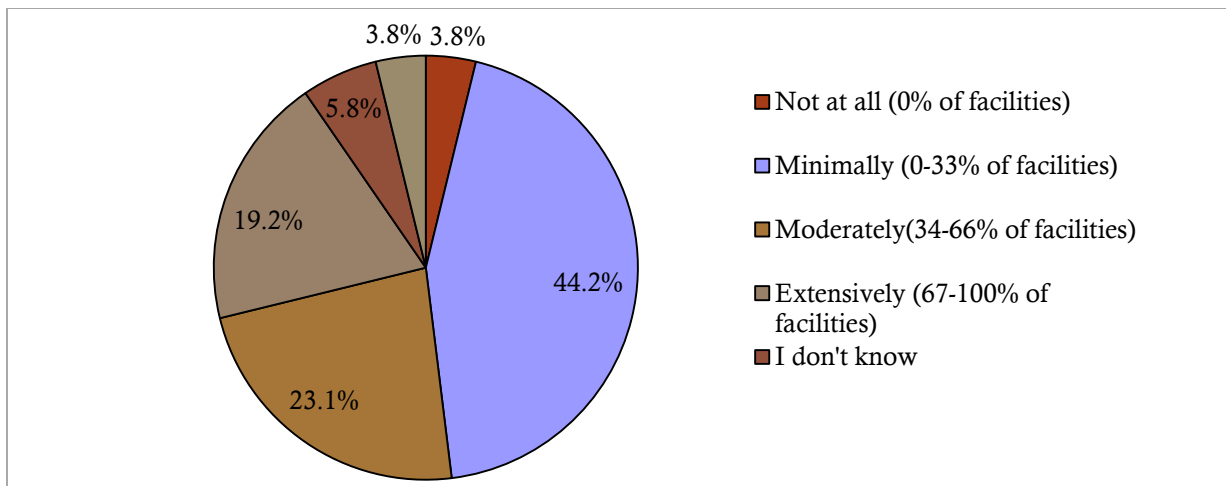
QUESTION 13 - WHAT (APPROXIMATE) PERCENTAGE OF INTERIOR LIGHTING IN YOUR SCHOOL/DISTRICT HAS BEEN REPLACED/RETROFITTED WITHIN THE LAST 7 YEARS?

Only 30.8% of the respondents have extensively upgraded interior lighting in their school/district over the last 7 years. 36.5% of respondents identified minimally to not-at-all.



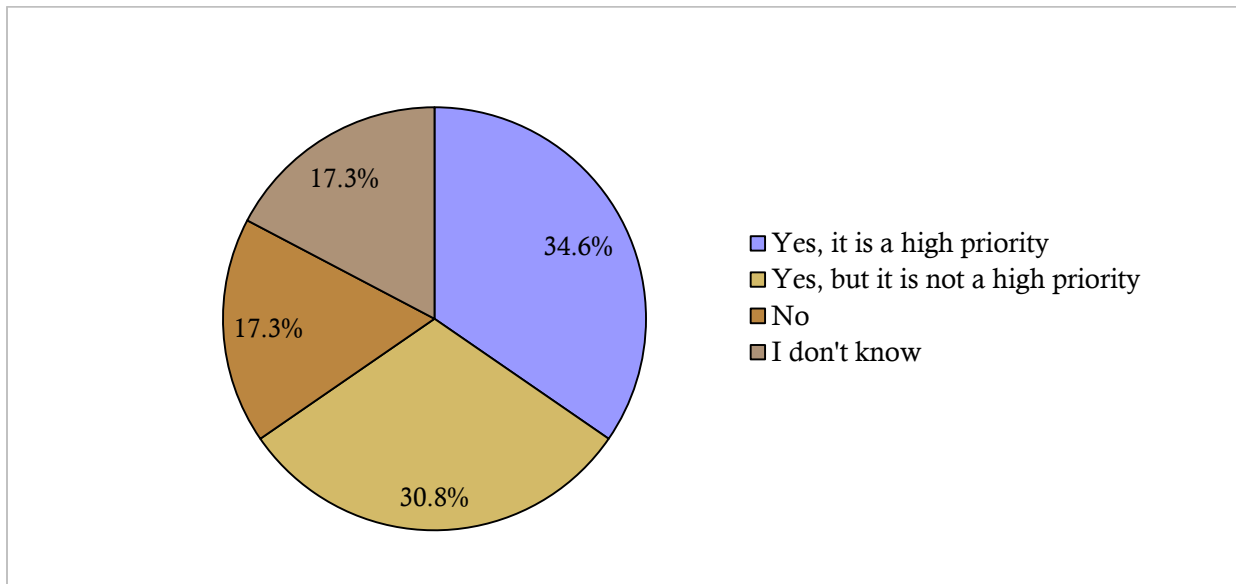
QUESTION 15 - WHAT (APPROXIMATE) PERCENTAGE OF HEATING AND COOLING EQUIPMENT (BOILERS, CHILLERS, ROOFTOP UNITS, ETC) IN YOUR SCHOOL/DISTRICT HAVE BEEN REPLACED/RETROFITTED WITHIN THE LAST 10 YEARS?

Only 19.2% of respondents have extensively replaced/retrofitted heating and cooling equipment within the last 10 years. Nearly 50% of respondents reported minimally to not-at-all retrofitting this equipment.



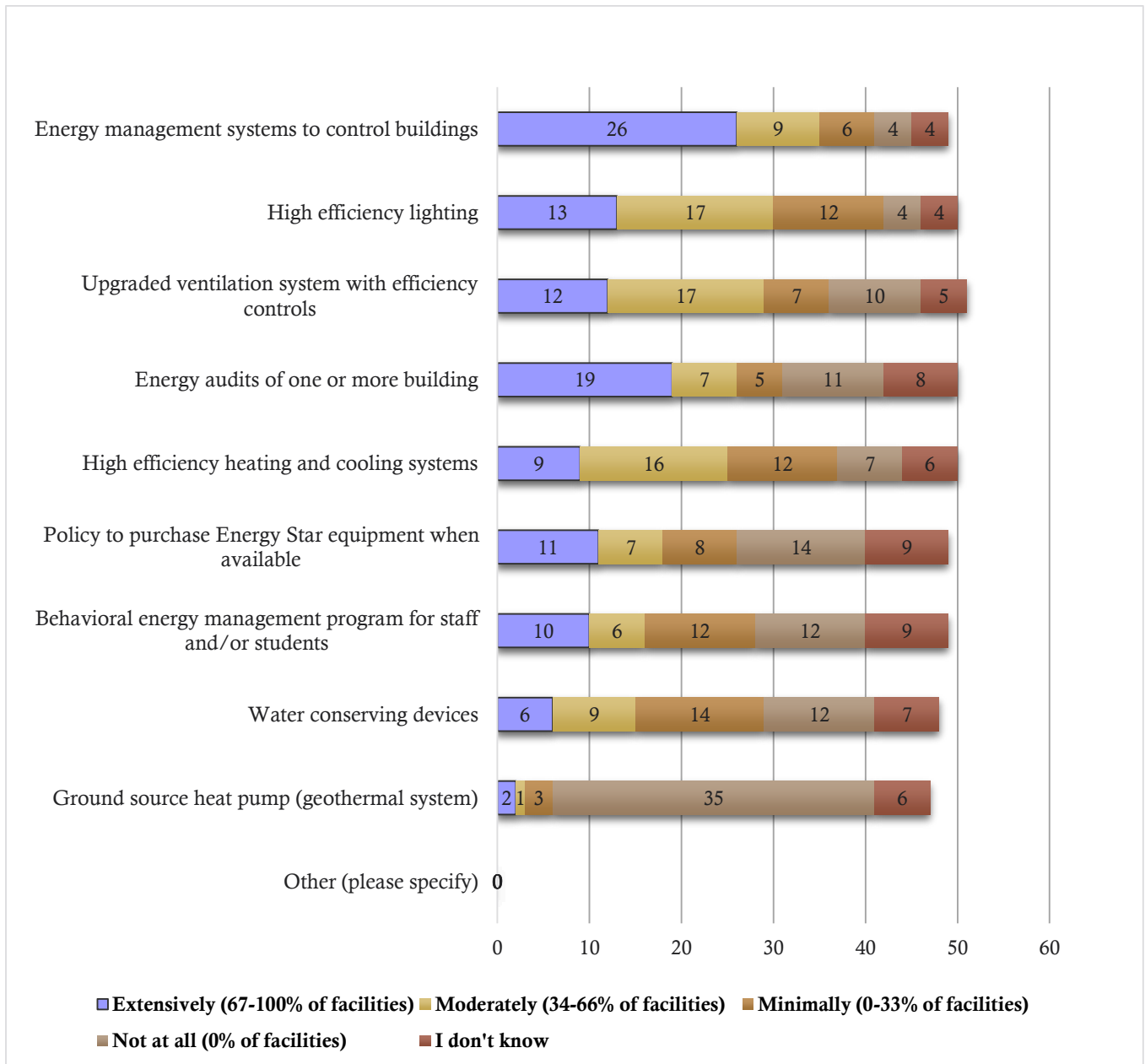
QUESTION 16 - DOES YOUR CAPITAL IMPROVEMENT PLAN (OR SIMILAR CAPITAL INFRASTRUCTURE STRATEGY) INCLUDE PROJECTS TO INTENTIONALLY IMPROVE ENERGY EFFICIENCY IN YOUR SCHOOL/DISTRICT FACILITIES?

65.4% of respondents indicated that energy efficiency is a priority in their capital improvement plans. However, more than a third of respondents do not prioritize or do not know if energy efficiency is a priority in their capital improvement planning.



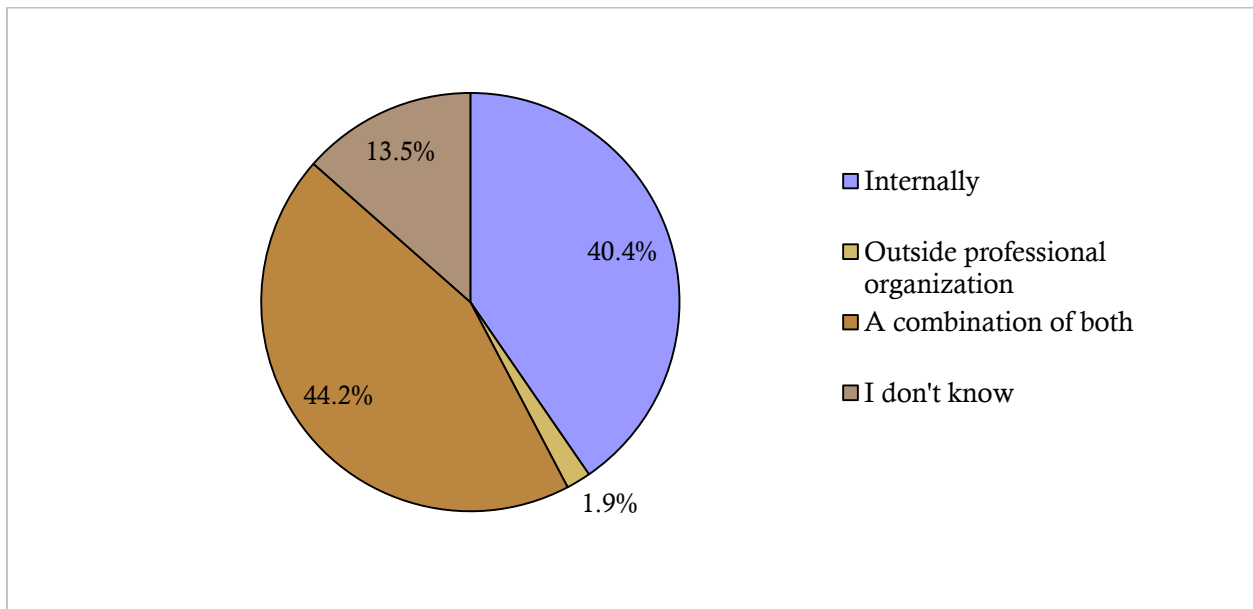
QUESTION 17 – WHICH OF THE FOLLOWING ACTIONS HAS YOUR SCHOOL/DISTRICT TAKEN TO DECREASE ITS USE OF ENERGY? (PLEASE RATE ALL THAT APPLY)

The schools indicated a variety of actions, with “Energy Management systems” reflecting the most common extensive upgrades at facilities. Water conserving devices and ground source heat pumps represented the least common action taken. Nearly a third of respondents reported extensively conducting energy audits in their school/district.



QUESTION 18 - ARE ENERGY EFFICIENCY IMPROVEMENTS IMPLEMENTED WITH INTERNAL FACILITIES STAFF OR IS YOUR SCHOOL/DISTRICT CONTRACTING WITH A PROFESSIONAL ENERGY EFFICIENCY BUSINESS OR ORGANIZATION TO MANAGE AND IMPLEMENT ONGOING IMPROVEMENTS?

Only 1.9% of respondents indicated that an outside professional organization is the sole provider for implementing ongoing improvements. In contrast, 40.4% of respondents indicated all projects are completed internally. In total, 84.6% of districts report either handling projects internally or a combination of internal and outside professional organizations for some support.

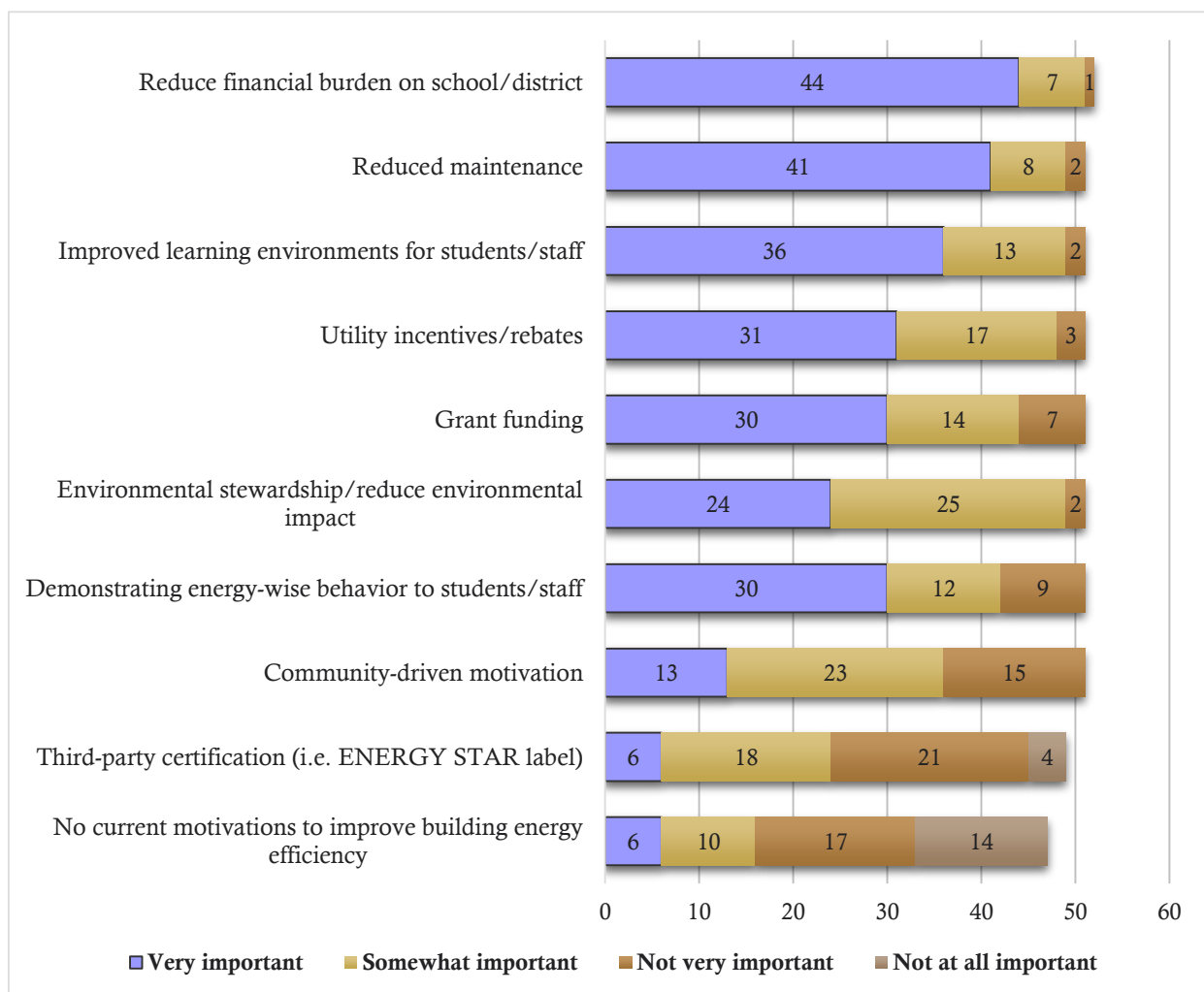


BARRIERS AND NEEDS – ENERGY EFFICIENCY

The following questions attempt to identify specific challenges and opportunities to increase investments in energy efficiency at respondents' school/districts.

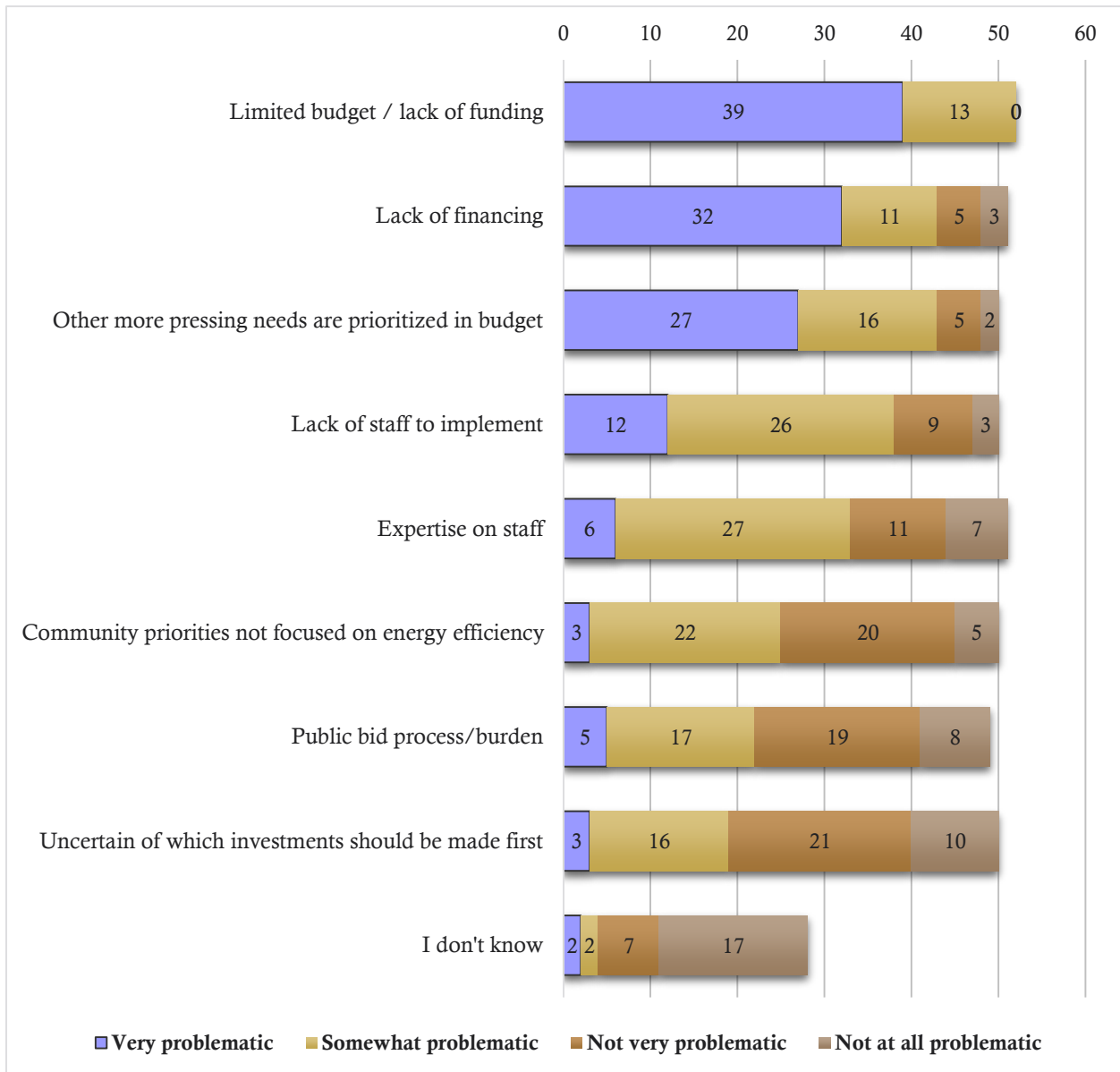
QUESTION 19 – HOW IMPORTANT ARE THE FOLLOWING FACTORS IN MOTIVATING YOUR SCHOOL/DISTRICT TO IMPLEMENT ENERGY EFFICIENCY IMPROVEMENTS? (PLEASE RATE ALL THAT APPLY)

“Reduce financial burden on school/district” ranked the most important factor amongst the choices presented, while “Third-party certification (i.e. ENERGY STAR label)” was least important after “No current motivations...”



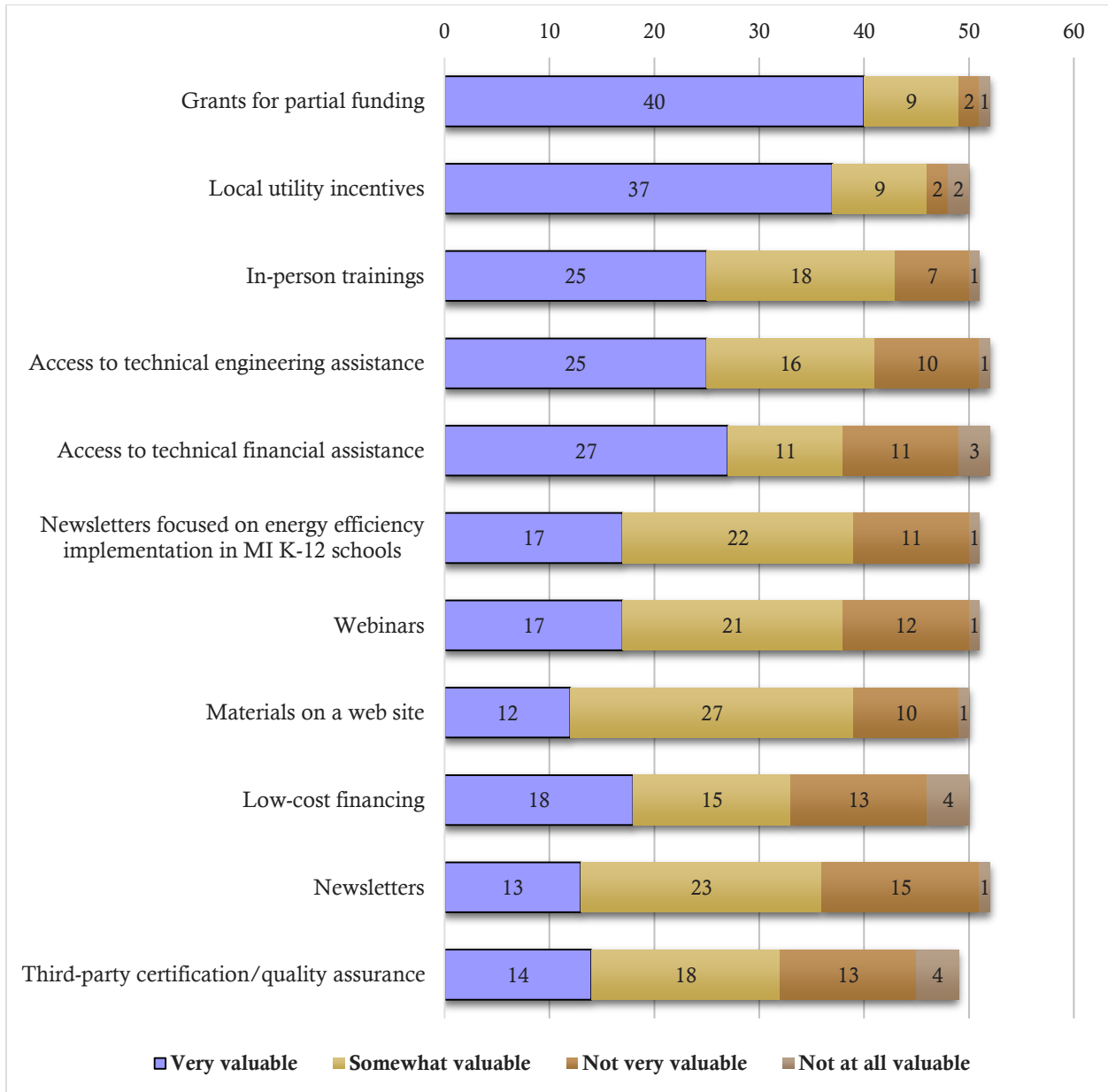
QUESTION 20 – TO WHAT EXTENT ARE THE FOLLOWING BARRIERS IMPACTING YOUR ABILITY TO IMPLEMENT ENERGY EFFICIENCY PROJECTS AT YOUR SCHOOL/DISTRICT? (PLEASE RATE ALL THAT APPLY)

Nearly 100% of those responding to the question identified “Limited budget/lack of funding” as problematic. Over one half of the respondents expressed confidence in prioritizing energy efficiency investments in the district.



QUESTION 21 – HOW VALUABLE WOULD THE FOLLOWING SUPPORT BE FOR YOUR SCHOOL/DISTRICT IN IMPLEMENTING MORE ENERGY EFFICIENCY PROJECTS? (PLEASE RATE ALL THAT APPLY)

Respondents scored “Grants for partial funding” and “Local utility incentives” as the most valuable. One in four respondents identified third-party certification such as ENERGY STAR as very valuable.

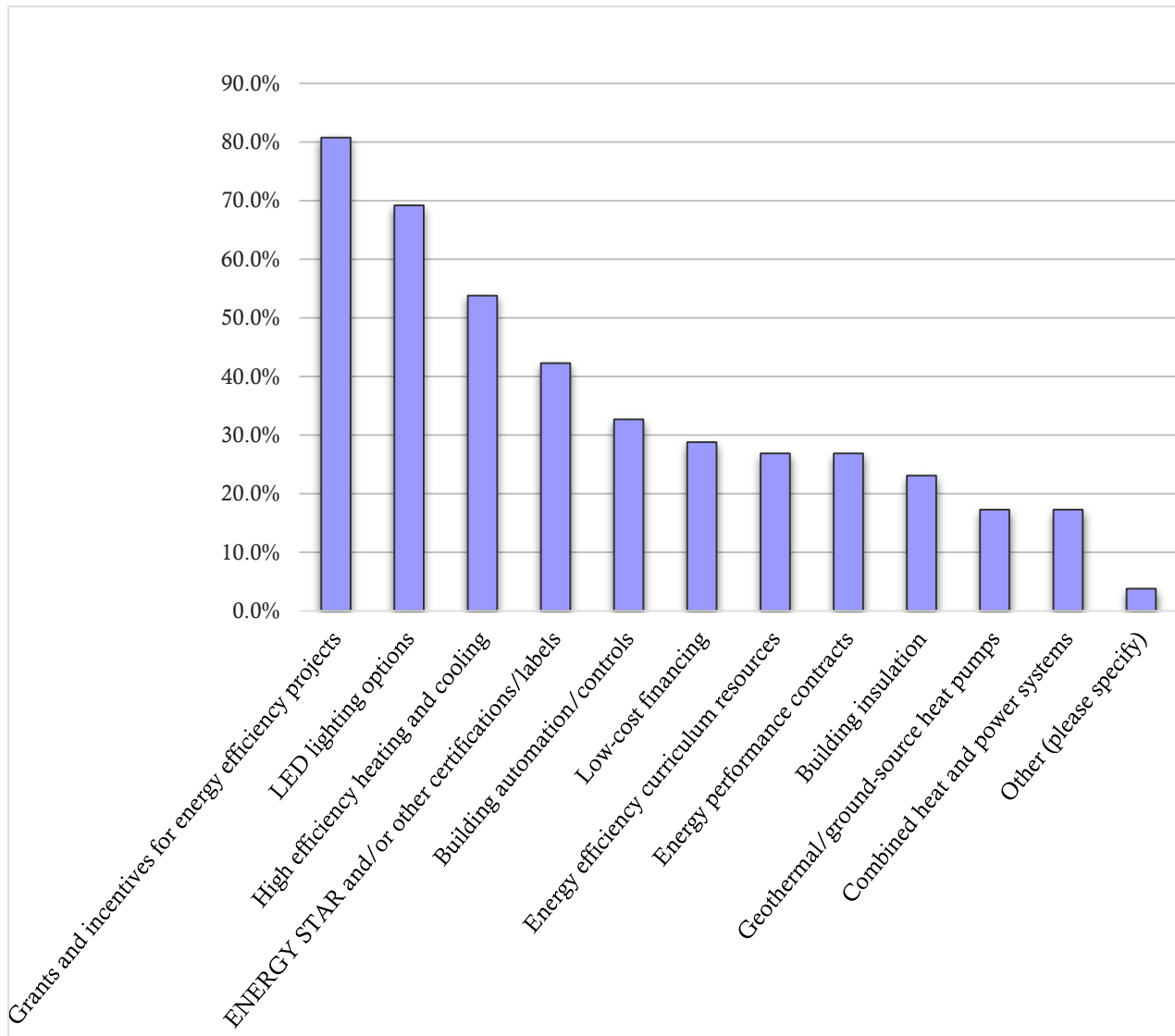


BARRIERS AND NEEDS – RENEWABLE ENERGY

The following questions attempt to identify specific challenges and opportunities to increase investments in renewable energy systems at respondents' school/districts.

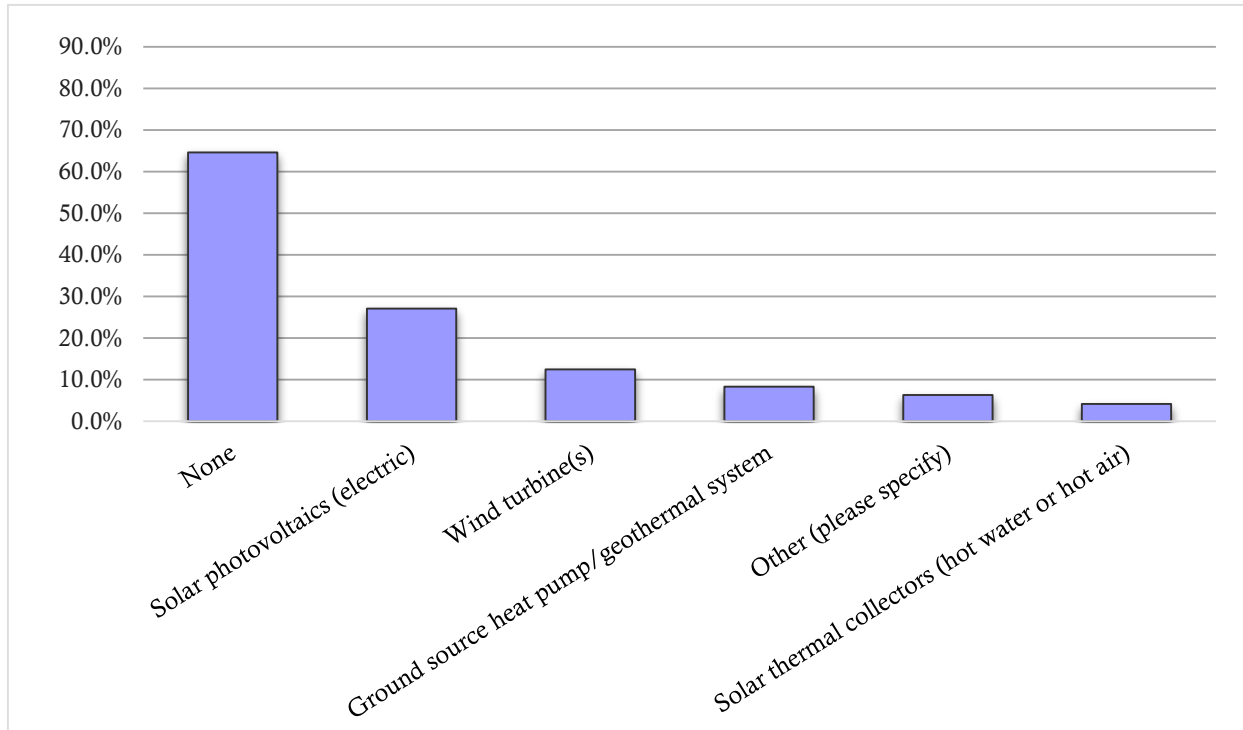
QUESTION 22 - WHAT TOPICS WOULD YOU BE INTERESTED IN LEARNING MORE ABOUT? (PLEASE SELECT ALL THAT APPLY)

More than three out of four respondents indicated they are interested in learning more about available grants and incentives for energy efficiency projects. Less than one in four were interested in learning about ground-source heat pumps or combined heat and power for their district facilities.



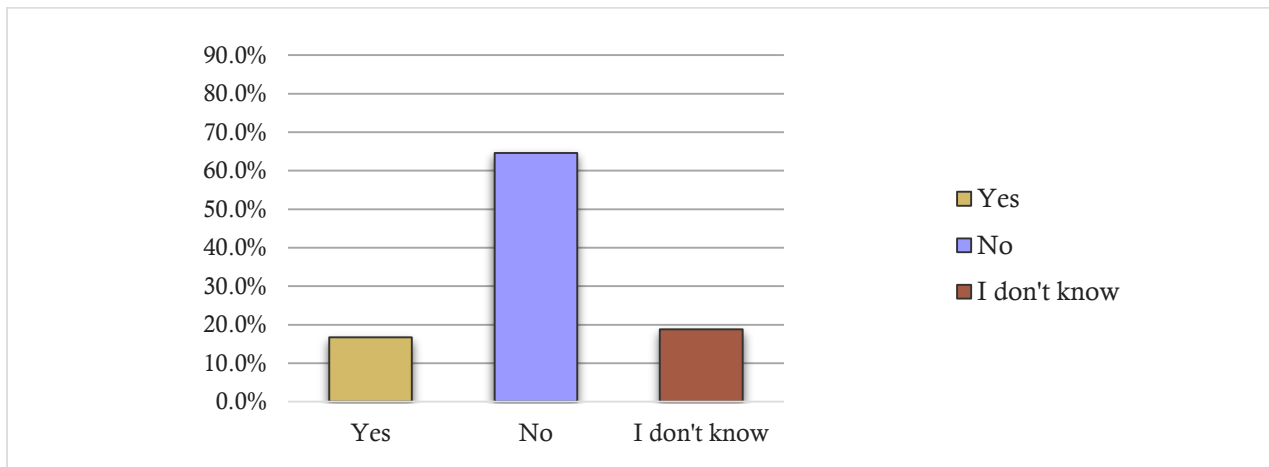
QUESTION 23 - DO YOU HAVE RENEWABLE ENERGY SYSTEMS CURRENTLY OPERATING IN YOUR SCHOOL/DISTRICT? (PLEASE CHECK ALL THAT APPLY)

More than half of respondents do not currently have onsite renewable energy in their school/district. However, more than one in four of those responding to the question indicated they have installed solar electric systems in their school/district.



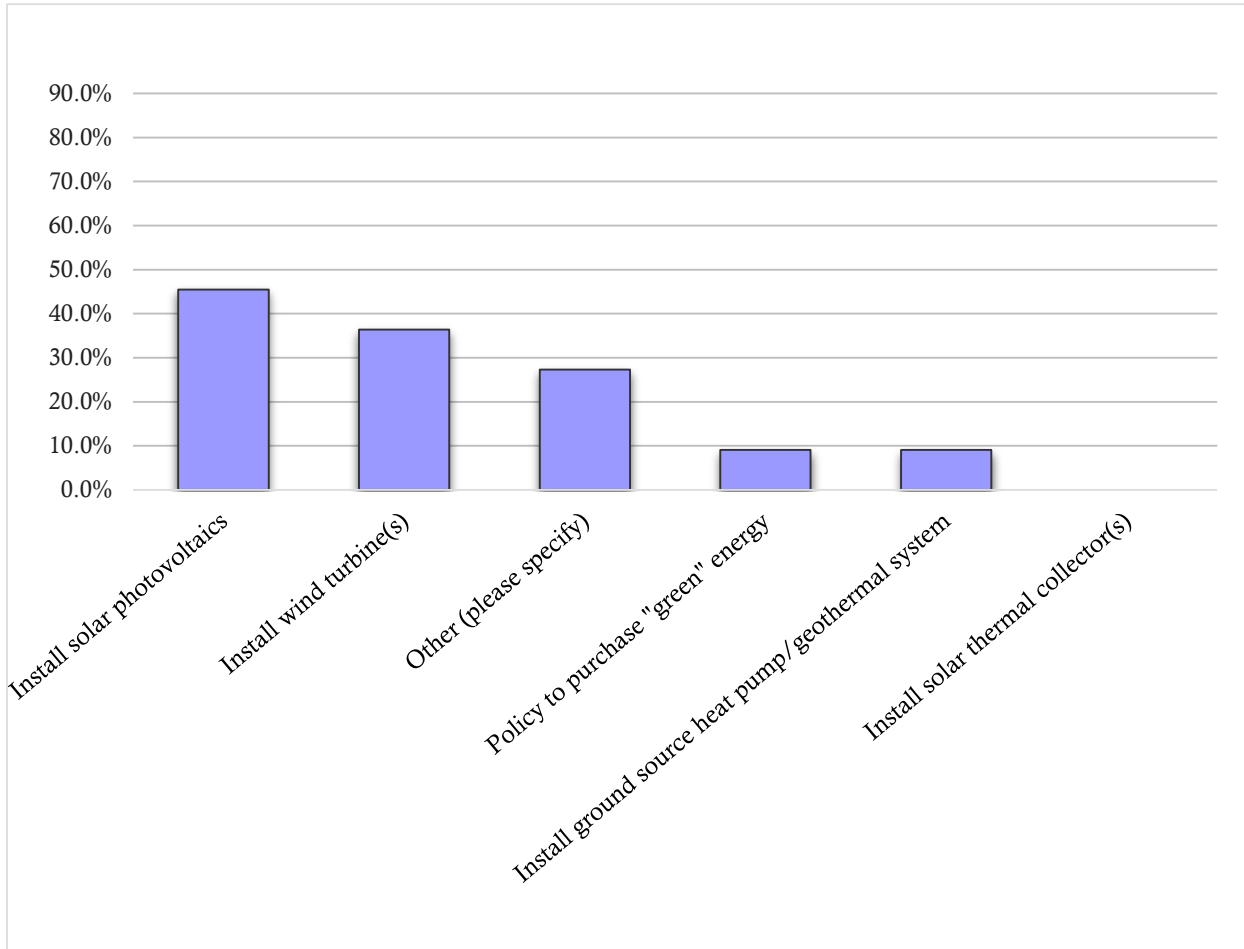
QUESTION 25 - DO YOU HAVE ACTIVE PLANS TO INSTALL RENEWABLE ENERGY SYSTEMS IN YOUR SCHOOL/DISTRICT BUILDING(S) IN THE NEXT 1-2 YEARS?

More than half of respondents currently have no plans to install renewable energy systems in the next one to two years. Approximately one in six respondents intend to install an onsite renewable system.



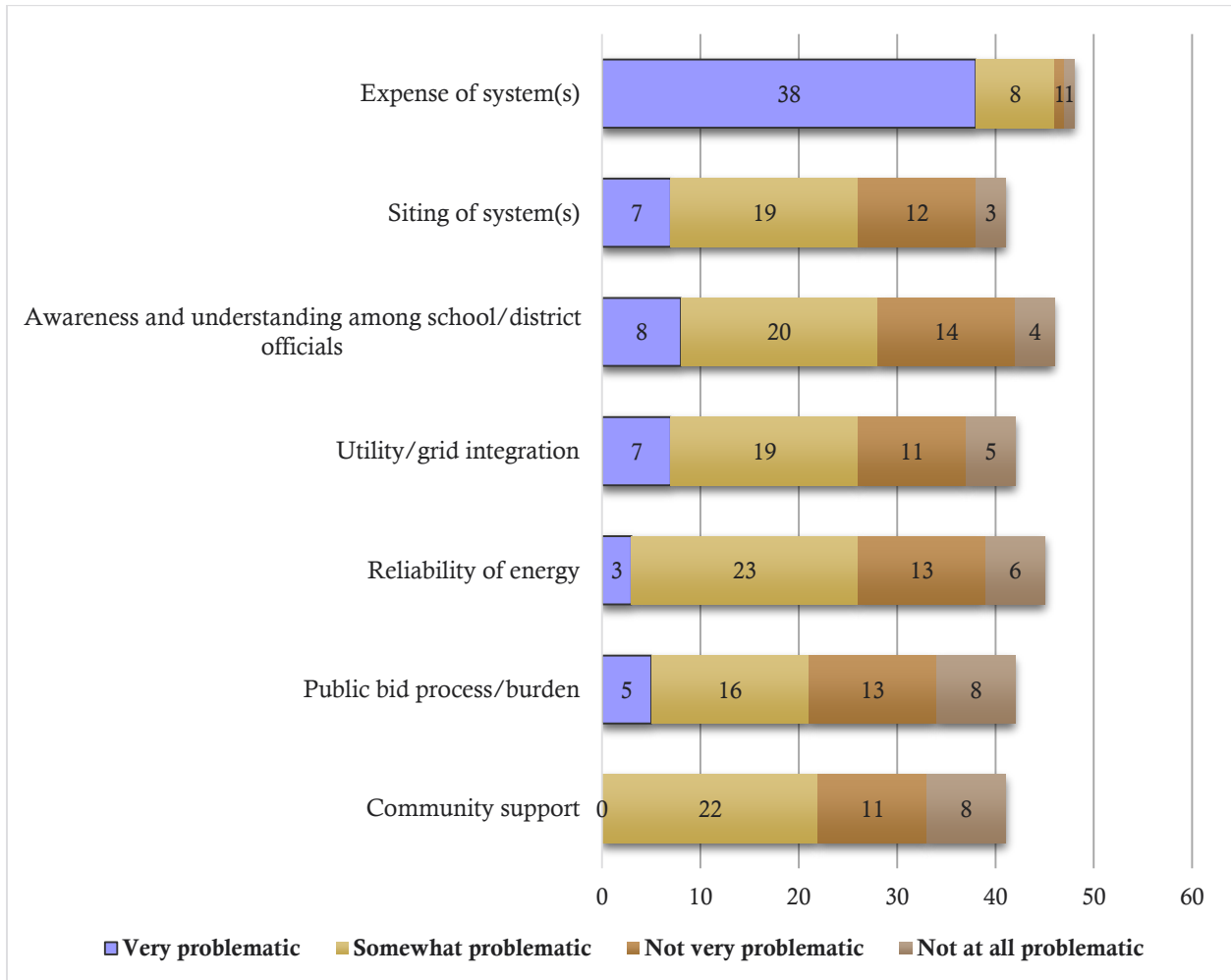
QUESTION 26 - IF YES (TO Q25), PLEASE DESCRIBE WHICH OF THE FOLLOWING ACTIONS YOUR SCHOOL/DISTRICT INTENDS TO TAKE TO UTILIZE RENEWABLE ENERGY IN THE NEXT 1-2 YEARS? (PLEASE CHECK ALL THAT APPLY)

Of the 14 respondents who responded “yes” to the previous question, 9 of 14 intend to install onsite solar and wind electric generation equipment.



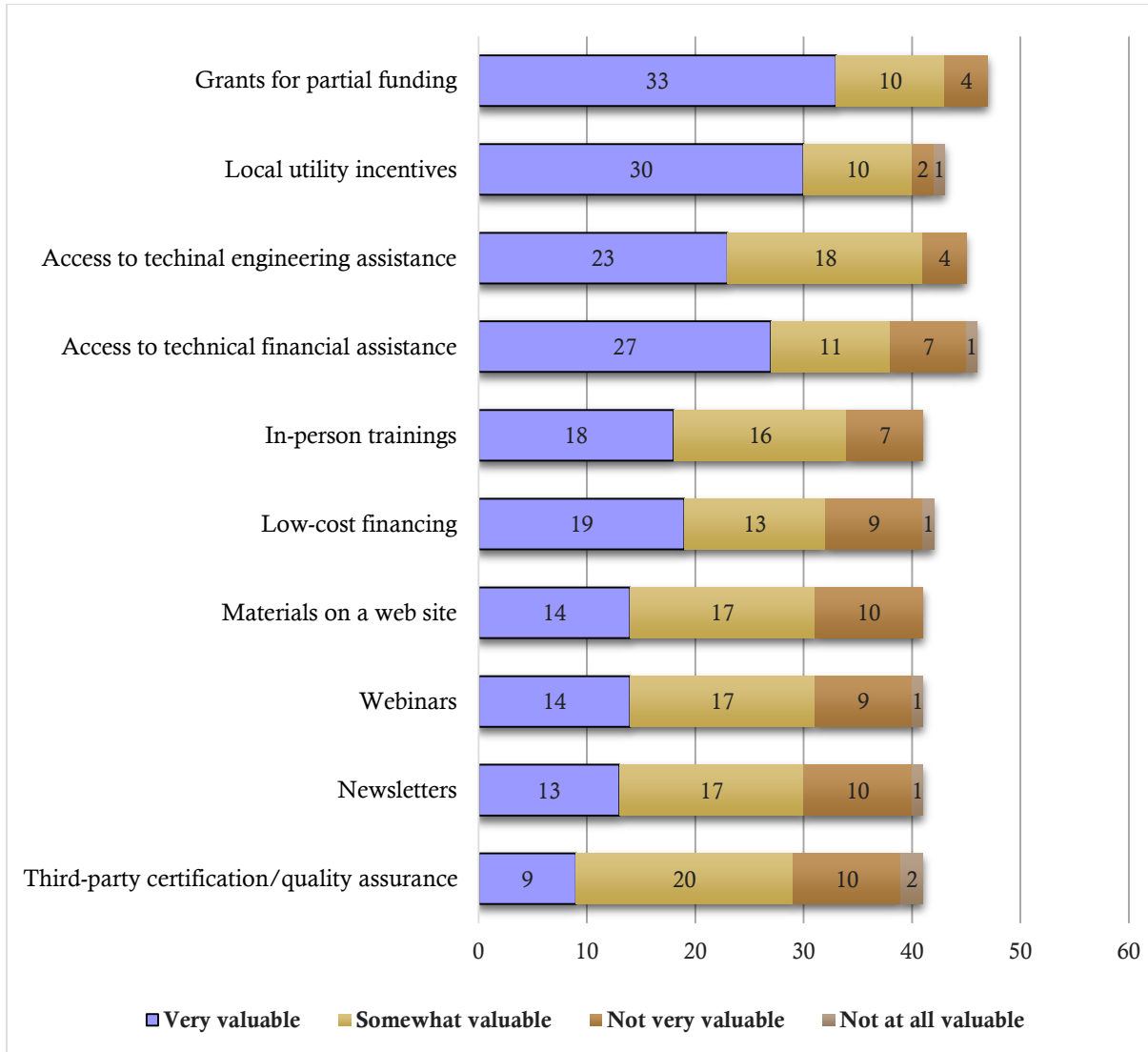
QUESTION 27 - TO WHAT EXTENT ARE THE FOLLOWING BARRIERS RESTRICTING YOUR SCHOOL/DISTRICT FROM IMPLEMENTING RENEWABLE ENERGY PROJECTS? (PLEASE RATE ALL THAT APPLY)

The expense of the equipment is identified as nearly five times more “very problematic” than any other answer. “Community Support” was the only answer with no selection as “very problematic.”



QUESTION 28 – HOW VALUABLE WOULD THE FOLLOWING SUPPORT BE FOR YOUR SCHOOL/DISTRICT IN IMPLEMENTING RENEWABLE ENERGY PROJECTS? (PLEASE RATE ALL THAT APPLY)

Answers to Question 28 are consistent with those identified in Question 21 (energy efficiency projects).

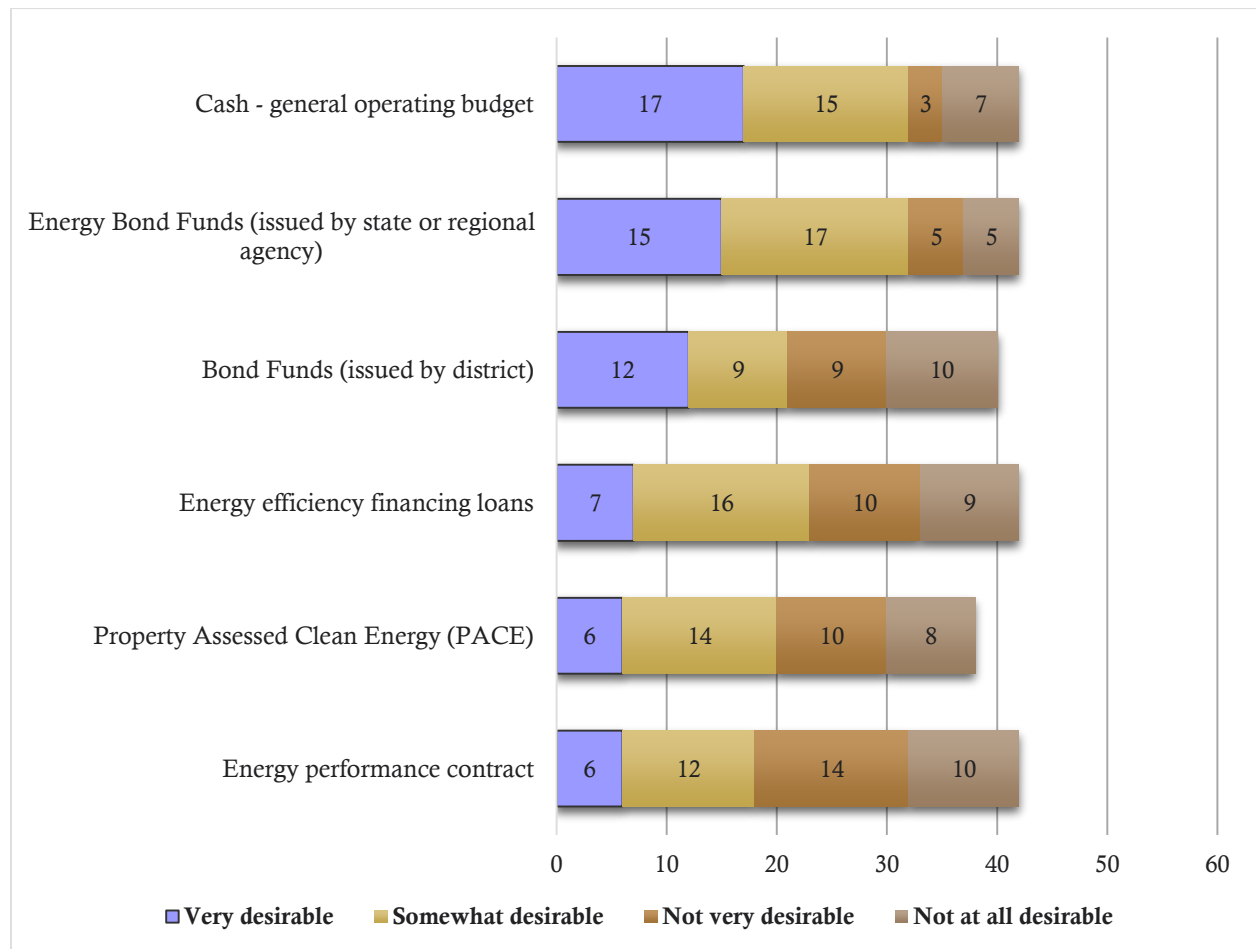


FINANCING

The following questions are meant to capture respondents' background and decision-making related to financing and funding investments in energy efficiency and renewable energy measures in their school/districts.

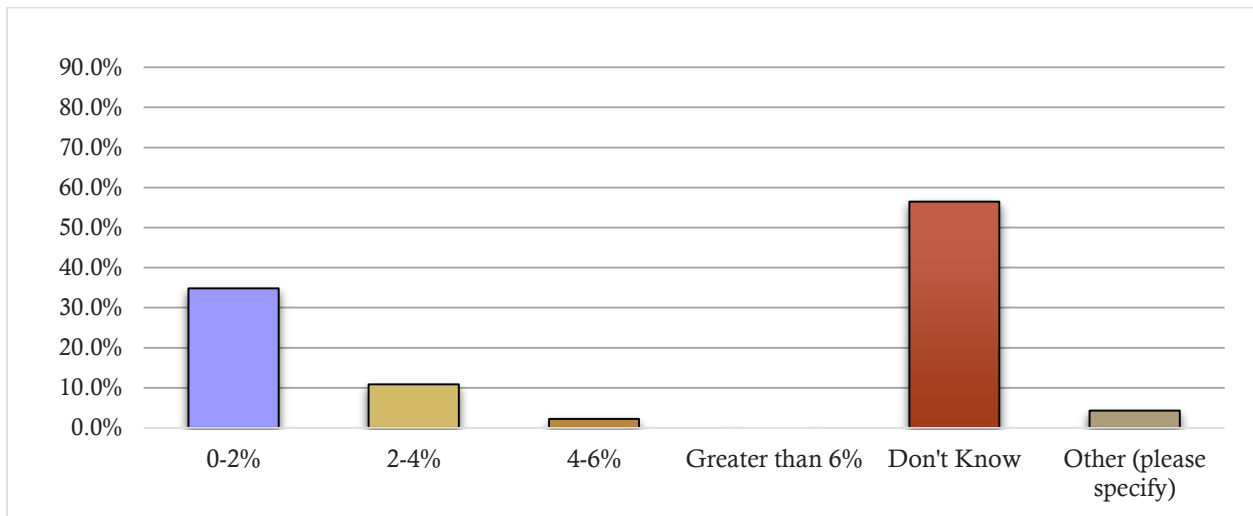
QUESTION 29 - WHICH OF THE FOLLOWING FINANCING OPTIONS WOULD BE MOST DESIRABLE FOR YOUR SCHOOL/DISTRICT IN IMPLEMENTING ADDITIONAL ENERGY EFFICIENCY OR RENEWABLE ENERGY PROJECTS IN YOUR FACILITIES? (PLEASE SELECT ALL THAT APPLY)

Of the financing options identified, “Energy Performance contract” was the least desirable option presented. Three in four respondents identified “Energy Bond Funds” as favorably desirable; nearly the equivalent desirability to “Cash-general operating budget.”



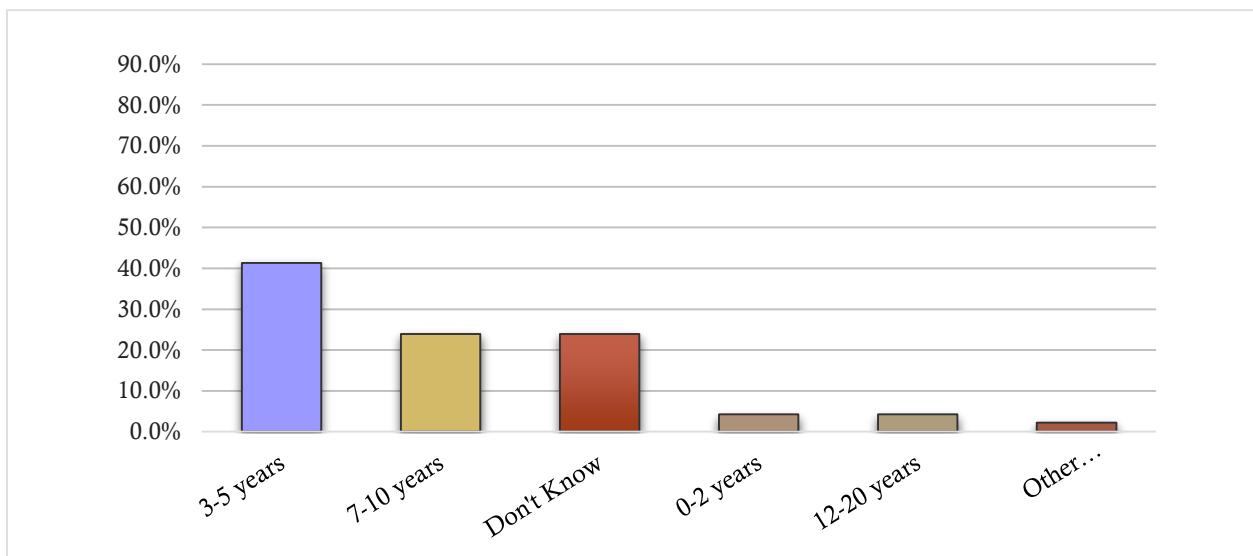
QUESTION 30 - ASSUMING THE TERM OF AN ENERGY EFFICIENCY LOAN IS EQUAL TO OR SHORTER THAN THE ENERGY SAVINGS PAYBACK OF THE IMPROVEMENTS OF WHICH THE LOAN FINANCES, WHAT INTEREST RATES DO YOU THINK YOUR SCHOOL/DISTRICT WOULD CONSIDER? (PLEASE CHECK ALL THAT APPLY)

More than one in two respondents identified “Don’t know” to this question. However, one in three responded with the lowest interest rate “0-2%” as the rate most likely to be considered.



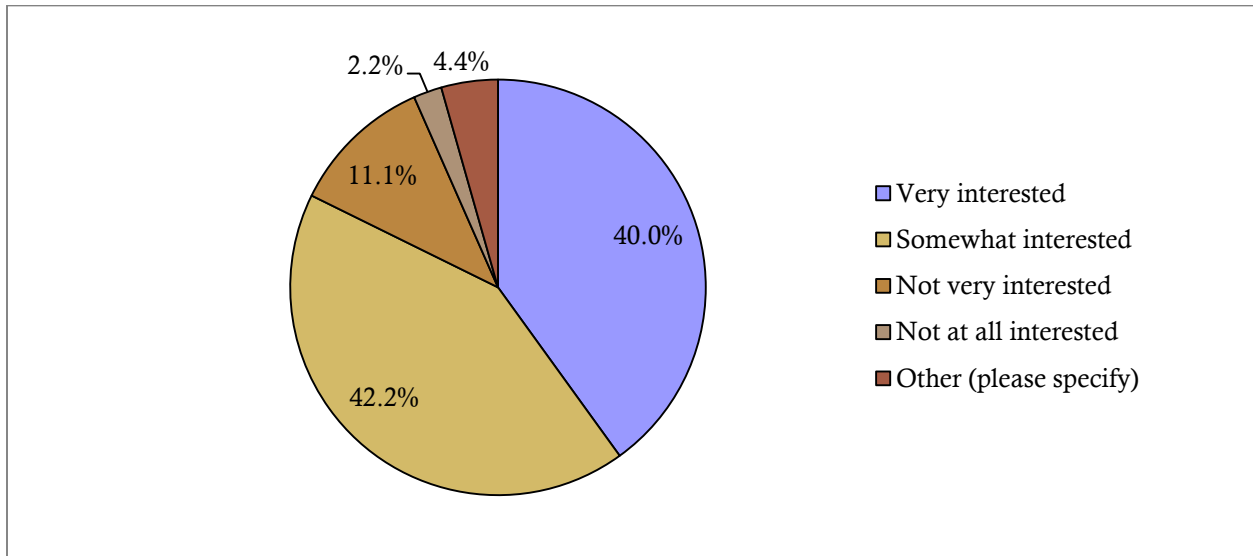
QUESTION 31 - IF YOUR SCHOOL/DISTRICT WAS TO MAKE INVESTMENTS IN ENERGY EFFICIENCY OR RENEWABLE ENERGY IMPROVEMENTS, WHAT WOULD BE THE LONGEST RETURN-ON-INVESTMENT (ROI) WINDOW YOU WOULD FIND ACCEPTABLE IF THE ENERGY SAVINGS PAID FOR THE FINANCE PAYMENTS? (PLEASE ENTER THE MAXIMUM SIMPLE PAYBACK TO MOVE A PROJECT FORWARD)

Nearly one in four respondents identified “Don’t know” to the above question. Of those selecting a ROI, more than two in five selected “3 to 5 years” as the maximum simple payback their school/district may consider.



QUESTION 32 - HOW INTERESTED WOULD YOUR SCHOOL/DISTRICT BE IN PARTICIPATING IN A STATEWIDE TECHNICAL ASSISTANCE AND FINANCING PROGRAM FOR MICHIGAN K-12 SCHOOLS TO IMPLEMENT ENERGY EFFICIENCY AND RENEWABLE ENERGY PROJECTS, BEGINNING IN THE FALL OF 2016?

Over 80% of respondents expressed interest in a statewide technical assistance and financing program for Michigan K-12 schools. Only 2.2% expressed no interest at all.



CONCLUSIONS

ENERGY AWARENESS IN MI K-12 SCHOOLS

A large percentage of respondents indicated that energy efficiency is important (90%) in their school/district and that they are tracking energy usage at their schools. However, more than half of respondents are using Excel based spreadsheets or just monitoring utility bills visually on a monthly basis. A small percentage (15%) were taking advantage of Energy Star Portfolio Manager while a number of other schools indicated they were using EnergyCAP or some other proprietary solution for tracking.

Only 20% of respondents indicated their school/district employed an Energy Manager, or personnel whose primary responsibility is energy management.

UNDERSTANDING BARRIERS

When asked specifically about the barriers that exist in moving projects forward, respondents most frequently responded that a “limited budget” and a “lack of funding” were very problematic, with lack of “expertise on staff” and “lack of staff to implement” also identified as problematic.

It is important to note that most schools prefer to handle projects internally or work collaboratively with outside professional organizations to execute projects. When asked how projects were implemented at their school/district, only one (1) respondent selected “outside professional organization” as a sole solution provider. This is consistent with feedback captured from 2009-11 and is important to consider when developing solutions for this market sector.

IDENTIFYING OPPORTUNITIES

Several opportunities have been identified through the survey. The baseline understanding of the current implementation percentage of a number of energy efficiency solutions, with a particular emphasis on lighting and heating/cooling plants. It appears there are tangible opportunities in both categories.

More than a third of respondents have done minimal to no lighting upgrades, while nearly 50% of respondents have not upgraded heating and cooling plants in the last ten (10) years – and likely longer. Other opportunities appear to exist related to ventilation systems, commissioning, behavioral management and water conservation. These represent significant dollar savings potential.

INTERPRETING NEEDS

In general, the school/district respondents sent a clear message: funding is a critical need for moving projects forward. Additionally, technical engineering and financing education and support seem to be important to respondents. Extra incentive funding and assistance can move a project in front of “other more pressing needs.”

A recurring theme was access to incentives/grants and low-cost funding. When asked about preferred interest rates and length of financing terms, most school/districts identified 0-2% financing packages with a 3-5 year simple payback window as a highly rated finance solution.

SUMMARY

In general, schools expressed a strong interest in energy efficiency, and indicated that assistance – either in the form of funding or engineering – would be beneficial to getting projects done. Additionally, they expressed

interest in a collaborative engagement that allowed schools to maximize the savings to their district and reduce maintenance and operating costs. They understand that there is monetary value and savings to be had from implementing efficiency measures in their schools.

The interest level appears to remain strong in participating in a statewide energy program for K-12 schools. Over 80% of respondents expressed interest in participating in technical energy and financing program. The list of school/districts responding to the survey are identified in the Appendix.

APPENDIX

LIST OF SCHOOL/DISTRICTS (QUESTION 1)

Clarkston Community Schools	Ingham ISD	Freeland Community Schools
Garden City Public Schools	West Bloomfield	Our Shepherd Lutheran
Wexford Missaukee ISD	Carson City Schools	Addison High School
Manchester Community Schools	Holton Public Schools	Saranac Community Schools
	St. Clair County RESA/Technical	
Grosse Pointe Public Schools	Education Center	Northwest Community Schools
Holland Public Schools	Kent Intermediate School District	Allen Park Public Schools
Livonia Public Schools	Swan Valley	Ypsilanti
DeWitt Public Schools	Monroe County ISD	Forest Park School District
Northville Public Schools	Au Gres-Sims School District	Walled Lake
	Detroit Edison Public School	
	Academy	Traverse Bay Area ISD
Muskegon Public Schools	Ovid-Elsie Area Schools	Chassell Township School
Kentwood	Dowagiac Union Schools	Adrian Public Schools
Brandywine Community School	Huron Valley Schools	South Redford Public Schools
Orchard View Schools	Lakeview School District	Republic-Michigamme
Royal Oak		Dearborn Heights School
	Cadillac Area Public Schools	District 7
Charlotte Public Schools	Alpena Public Schools	Eaton Rapids
Oakland Schools ISD	Parchment School District	Romeo
Bangor Public Schools	Warren Woods Public Schools	
Hamilton Academy	Wayne RESA	
Holt Public Schools	Hartland Consolidated Schools	
Plainwell C/S		

RESPONDENT JOB TITLES (QUESTION 2)

Assistant Superintendent for Finance & Operations	Supervisor Operations	Teacher
Assistant Superintendent of Finance & Operations	Director of Operations	Director of STEAM
Director of Facilities and Transportation	Facilities Director	Teacher
Manager of Operations	Director	Superintendent/Principal
Director of Finance & Operations	Facilities Supervisor	Superintendent
	Director of Maintenance & Transportation	Science Department Head/ Science Teacher
Facility Consultant	Director of Transportation, Buildings, and Grounds	Instructor
Operations Manager	Business Manager	Teacher
Exec Director of Business, Operations, HR	Director of School & Community Partnerships	Science Teacher
Facility Manager	Director of Operations	Business Manager
Business Manager	Maintenance director	Science Teacher
Executive Director of Operations	Maintenance & Construction Manager	Teacher
Supervisor of Facilities management	Director of Operations and Student Services	Science Department Chair
Dir of operations		

Facilities Director
 Supervisor of Facilities
 Director of Operations
 Director of Business and
 Operations

 Maintenance Director
 Supervisor of Energy and
 Building Operations
 Director of Facilities,
 Transportation and Safety

Director of Finance
 Dir. Facilities and Transportation
 Director of Operations
 Director of Facilities and
 Transportation
 Local District Facilities Services
 Administrator

 Director of Operations

 Executive Director, Operations

Engineer/Parent
 Business Manager
 Operations Director
 Assistant Superintendent
 for Ancillary Services
 Manager, Facilities and
 Purchasing

 Teacher