Black Hills Power, Inc. d/b/a Black Hills Energy

Energy Efficiency Solutions Status Report Program Year 2018

Prepared by:
Applied Energy Group
211 Broad Street, Suite 206 · Red Bank, NJ 07701
Tel (732) 945-9941 · Fax (732) 945-9942
www.appliedenergygroup.com

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Executive Summary

Black Hills Power, Inc. d/b/a Black Hills Energy ("BHP" or the "Company") is a South Dakota corporation regulated by the South Dakota Public Utilities Commission (the "Commission") that provides electricity to approximately 70,000 customers in western South Dakota, north-eastern Wyoming and southeastern Montana. BHP is a wholly owned subsidiary of Black Hills Corporation, which provides natural gas and electricity to more than 1.2 million customers throughout the Midwest region of the United States.

This report presents a status report of Program Year 2018 ("PY2018"), which ran from September 1, 2018 through August 31, 2019, for BHP's Commission approved Energy Efficiency Solutions Plan. BHP's Energy Efficiency Solutions portfolio is composed of residential and non-residential programs. Each program has been designed to address the needs of various customer types. The programs include:

Residential

- Residential Lighting
- Appliance Recycling
- Residential High Efficiency HVAC
- Whole House Efficiency
- School-Based Education

Commercial & Industrial (C&I)

- Prescriptive
- Custom

PORTFOLIO SUMMARY

Overall results for PY2018 show that BHP spent approximately 113 percent of the total budget and achieved 94 percent of the energy savings goal and 68 percent of the demand savings goal. Table ES1 presents projected budgets and actual expenditures by sector for PY2018. Any costs that can be directly assignable to a program are included within the Residential and Non-Residential programs. The goals presented in the tables below represent the goals that were originally approved in the plan. The difference between the actual savings attained and the budget spent is largely attributed to differences in program design of the Plan compared to actual measures installed.

For ease of administration, BHP established two work orders associated with Cross Marketing & Training and General Administration – these dollars were allocated back to the two categories (Residential and Commercial & Industrial Programs) of the Energy Efficiency Solutions Adjustment (EESA) rate(s). The General Administration budget includes all administrative costs that were included in the original plan design for each measure. The Cross Marketing & Training budget comprised of all the marketing costs included in the original plan design for each measure plus additional Cross Marketing & Training costs for the entire Energy Efficiency Solutions Plan.

Three programs did not pass the cost effectiveness threshold of 1.0.
They are:

Appliance Recycling Program- .92
Residential High Efficiency HVAC Program- 0.64
Whole House Efficiency program- 0.64

The Appliance Recycling Program fell just short of being cost effective. The consistent outreach and education by the Company continues to drive participation. This program has now reached beyond the urban areas and is now active in the rural areas of the service territory. The cost to implement and deliver this program increases due to the additional miles driven to recycle these units.

The Residential High Efficiency HVAC Program fell short of the cost effectiveness threshold at 0.64. However, the program was able to claim 163% of the planned energy savings as approved in the portfolio. The Company will continue to work with the local HVAC dealers and manufacturers to ensure ample supply of qualifying equipment is available and offered to customers.

Whole House Efficiency Program fell short of the cost effectiveness threshold at 0.64. Audit programs across the Companies footprint are rarely cost effective as a stand-alone program. The value of audit programs is the information it provides customers. Many customers have issues identified during the audit that require an investment in both time and dollars. In some cases, customers may replace the equipment identified during the audit months or years later at the time of equipment failure.

Table ES1 provides an overall summary of PY2018 sector goals and actual sector expenditures.

TABLE ES1: PY2018 PORTFOLIO SUMMARY OF ACTUAL SPEND VS PROJECTED BUDGET BY SECTOR

Sector	PY2018 Goal	PY2018 Actual	% of Budget
Residential	$140,674	$125,783	89%
Commercial & Industrial	$542,027	$713,262	132%
Cross Marketing & Training	$118,710	$104,730	88%
General Administration	$58,564	$29,703	51%
Total	**$859,975**	**$973,478**	**113%**

Table ES2 provides PY2018 sector budgets and actual sector expenditures. The General Administration sector budget was 51% of the estimated budget. There were a variety of applications that were analyzed but did not pass the incremental payback requirements of two years or greater or did not pass the TRC benefit-to-cost ratio of one or higher. The rebate applications that did not pass still had funding used towards their analysis. The overall budget exceeded the $859,975 approved budget by 13%. As the energy efficiency programs mature and codes and standards increase, the participation costs per customer increases.

TABLE ES2: PY2018 PORTFOLIO SUMMARY OF PROGRAM BUDGET VS ACTUAL EXPENDITURES BY PROGRAM[1]

	PY2018 Budget	PY2018 Expenditures	% of Budget
Residential Programs			
Residential Lighting	$30,212	$6,866	23%
Residential Appliance Recycling	$13,104	$22,626	173%
Residential HVAC	$23,859	$42,560	178%
Whole House Efficiency	$10,350	$1,692	16%
School-Based Energy Education	$63,150	$52,040	82%
C&I Programs			
Prescriptive	$97,118	$48,956	50%
Custom	$444,910	$664,305	149%
Cross Marketing & Training	$118,710	$104,730	88%
General Administration	$58,564	$29,703	51%
Total	**$859,975**	**$973,478**	**113%**

[1] Program expenditures include rebates to BHP customers and depending on the program, include only some funds spent for marketing and advertising. See Exhibit 3 for details on Community Outreach and Events.

Tables ES3 provides PY2018 sector energy saving goals and actual energy savings.

TABLE ES3: PY2018 ENERGY SAVINGS (KWH) BY SECTOR

	PY2018 Goal	PY2018 Actual	% of Goal
Residential Programs	862,610	843,855	98%
C&I Programs	4,253,630	3,986,177	94%
Total	**5,116,240**	**4,830,033**	**94%**

Table ES4 provides PY2018 energy saving goals and actual energy savings by program.

TABLE ES4: PY2018 ENERGY SAVINGS (KWH) BY PROGRAM

	PY2018 Goal	PY2018 Actual	% of Goal
Residential Programs			
Residential Lighting	139,933	69,372	50%
Residential Appliance Recycling	105,515	123,379	117%
Residential HVAC	109,356	177,997	163%
Whole House Efficiency	31,406	4,648	15%
School-Based Energy Education	476,400	468,460	98%
C&I Programs			
Prescriptive	1,369,713	407,275	30%
Custom	2,883,917	3,578,902	124%
Total	**5,116,240**	**4,830,033**	**94%**

Table ES5 provides PY2018 demand saving goals and actual demand savings by sector.

TABLE ES5: PY2018 DEMAND SAVINGS (KW) BY SECTOR

	PY2018 Goal	PY2018 Actual	% of Goal
Residential Programs	103.5	74.2	72%
C&I Programs	1,046.5	709.7	68%
Total	**1,150.0**	**783.8**	**68%**

Table ES6 provides PY2018 demand saving goals and actual demand savings by program.

TABLE ES6: PY2018 DEMAND SAVINGS (KW) BY PROGRAM

	PY2018 Goal	PY2018 Actual	% of Goal
Residential Programs			
Residential Lighting	12.3	6.1	49%
Residential Appliance Recycling	12.0	14.1	117%
Residential HVAC	27.4	6.4	23%
Whole House Efficiency	3.8	0.4	11%
School-Based Energy Education	48.0	47.2	98%
C&I Programs			
Prescriptive	347.8	100.5	29%
Custom	698.7	609.2	87%
Total	**1,150.0**	**783.8**	**68%**

Table ES7 provides PY2018 sector cost-effectiveness and overall portfolio cost-effectiveness results.

TABLE ES7: TOTAL PORTFOLIO COST-EFFECTIVENESS RESULTS

Sector	TRC	UCT	SCT	PCT	RIM
Residential Programs	0.88	1.30	1.21	8.45	0.19
C&I Programs	1.58	1.73	2.11	8.14	0.25
Portfolio	**1.27**	**1.43**	**1.70**	**8.19**	**0.24**

Residential Programs

BHP's residential Energy Efficiency Solutions programs serve residential customers, encouraging investment in energy efficient measures such as lighting, water heating, heating and cooling equipment and whole house efficiency.

Residential Lighting

The Residential Lighting program's primary objective is to secure energy savings by incentivizing the purchase of ENERGY STAR® qualified lighting.

Table 1 provides the Residential Lighting program participation goals compared to actual program participation.

TABLE 1: RESIDENTIAL LIGHTING PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation			
LED	4,060	1,293	32%
ENERGY STAR LED Fixture	125	317	254%
Expenditures	$30,212	$6,866	23%
Energy Impacts (kWh)	139,933	69,372	50%
Demand Impacts (kW)	12.3	6.1	49%

BHP achieved approximately 50 percent of its energy and demand savings goals on 23 percent of budgeted expenditures. The total resource cost test increased from 0.90 in PY2017 to 1.01 in PY2018. The Company increased its marketing and outreach efforts in respect to LED bulbs. The energy efficiency staff has identified areas in which to help improve participation. As an example, some staff at the local stores that sell LED bulbs have provided inaccurate information to potential participants regarding bulb requirements. The Company has had to reject many applications due to the bulbs not meeting Energy Star standards. The energy efficiency staff will reengage with local retail outlets to provide a more accurate picture of requirements.

Table 2 provides the Residential Lighting program cost-effectiveness analysis results, based on program activity.

TABLE 2: RESIDENTIAL LIGHTING PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	1.01
Utility Cost Test	2.34
Societal Cost Test	1.37
Participant Test	5.47
Ratepayer Impact Measure Test	0.20

Residential Lighting – Highlights and Challenges

LED Bulbs

The Residential Lighting program provides a rebate-after-receipt program for Energy Star-rated LED bulbs purchased through any retail outlet, including big box chain stores. BHP customers receive a rebate, up to $5/bulb, after submitting a rebate application, with proof of purchase, and BHP has verified their account status. There is an annual limit of 40 bulbs per customer.

The impact of the rebate-after-receipt option has been positive for BHP customers due to the flexibility of where bulbs can be purchased. Customers have additional options to replace other types of incandescent bulbs. BHP has included additional bill messaging to remind each customer that only Energy Star-rated bulbs qualify for a rebate-after-receipt. By sponsoring Energy Star-rated bulbs, BHP can assure better quality and longer life for each rebated LED bulb. The Company will again reach out to the local box stores and other retail outlets to update them on LED rebate requirements.

Residential Appliance Recycling

The Residential Appliance Recycling program goal is to remove inefficient refrigerators and freezers from the electric system and dispose of them in an environmentally safe and responsible manner. Recycled refrigerators and/or freezers must be between 10 and 30 cubic feet in size and in operating condition. Customers received a $50 rebate per qualifying unit recycled, limited to two rebates per customer over the life of the program. The rebate cap is for each service location and BHP monitors activity through its rebate processing software - VisionDSM.

Table 3 provides the Residential Appliance Recycling program goals compared to actual program performance.

TABLE 3: RESIDENTIAL APPLIANCE RECYCLING PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation			
Refrigerator Recycle	75	76	101%
Freezer Recycle	8	23	288%
Expenditures	$13,104	$22,626	173%
Energy Impacts (kWh)	105,515	123,379	117%
Demand Impacts (kW)	12.0	14.1	117%

In PY2018, BHP exceeded participation and savings goals as well as the budget. BHP achieved 101 percent of the participation goal for refrigerator recycling and 288 percent for freezer recycling. Overall, BHP achieved 117 percent of its energy and demand savings goals on 173 percent of budgeted expenditures.

Table 4 provides the Residential Appliance Recycling cost-effectiveness analysis results, based on program activity.

TABLE 4: RESIDENTIAL APPLIANCE RECYCLING PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	0.92
Utility Cost Test	1.10
Societal Cost Test	1.26
Participant Test	12.65
Ratepayer Impact Measure Test	0.18

Residential Appliance Recycling – Highlights and Challenges

In PY2018, there continued to be an interest in recycling refrigerators and freezers. Freezers out performed refrigerators when comparing to the planned goal percentage. One challenge that BHP experienced in PY2018 was a delay between the time the contractor picked up the refrigerator and/or freezer from customers in the Black Hills area compared to customer expectations. BHP controls the costs associated with pickups by having the contractor schedule trips when there are multiple refrigerators and/or freezers to be picked up in one area. This practice has been implemented since the start of the program in 2011. The Company has experienced an increase in participation outside the more populated areas, which increased expenses due to the more remote pickup locations. The Company, while trying to control expenses, is excited that a larger cross section of our customers is participating due to the increased marketing efforts by the staff. The five to six-week potential lead time in refrigerator and/or freezer pickups is explained to customers when scheduling occurs.

Residential High Efficiency HVAC

The objective of the Residential High Efficiency HVAC program is to encourage residential customers to purchase and install energy efficient HVAC equipment. Customers were eligible to receive the following rebates:

Measure	Rebate
Electric Furnace to Heat Pump Replacement (1-5 tons, SEER ≥15 & HSPF ≥8.5)	$1,500 per system
Central Air Conditioner ≥15, EER ≥12.5	$60 per ton

Table 5 provides Residential High Efficiency HVAC program goals compared to actual program performance.

TABLE 5: RESIDENTIAL HIGH EFFICIENCY HVAC PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation			
Electric Furnace to Heat Pump Replacement	6	15	250%
Central Air Conditioner	75	8	11%
Expenditures	$23,859	$42,560	178%
Energy Impacts (kWh)	109,356	177,997	163%
Demand Impacts (kW)	27.4	6.4	23%

In PY2018, BHP achieved 250 percent of the heat pump goal and 11 percent of the central air conditioner participation goals. BHP achieved 163 percent of its energy savings goal and 23 percent of

its demand savings goals on 178 percent of budgeted expenditures. Central air conditioners (SEER 15 and above) were added as a measure option in PY2017. With the low cost of natural gas, cooling options to pair with natural gas heating systems is expected to pick up. Participation was associated with two measures, Heat Pump SEER ≥15 Replace Electric Furnace and CAC SEER ≥15. The percentage differences between expenditures and energy/demand impacts is primarily due to the portfolio mix of actual participation rate compared to the original goals.

Table 6 provides Residential High Efficiency HVAC cost-effectiveness analysis results, based on program activity.

TABLE 6: RESIDENTIAL HIGH EFFICIENCY HVAC PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	0.64
Utility Cost Test	1.33
Societal Cost Test	0.88
Participant Test	4.23
Ratepayer Impact Measure Test	0.18

Residential High Efficiency HVAC – Highlights and Challenges

There were a variety of challenges faced during PY2018 which resulted in lower than expected participation. The Company experienced similar issues as noted in PY2017 report. Many applications were rejected due to the energy efficiency requirements not being met. The Company will increase its outreach to the trade ally associations to better educate the trade allies and, more importantly, our customers regarding qualifying equipment. In addition, residential customers called inquiring about the HVAC rebate programs *after* the equipment was already installed.

Previously, the majority of the outreach and education for this particular program came from the Electro-Technology Expo, which had over 300 attendees, and various home show events throughout BHP's service territory. For PY2019, one-on-one training will be given to the HVAC contractors in an effort to increase program participation.

Whole House Efficiency Program

The Whole House Efficiency program encourages whole house improvements to existing homes, by offering comprehensive home energy audits. Customers received a whole house energy audit, air sealing, and other low-cost, easy-to-install measures at a cost of $50 per audit. The whole house energy audit identified efficiency improvements and provided the customer with information on other BHP energy efficiency programs.

Measures offered through the program will include:

- Air sealing
- Hot Water Pipe Insulation
- Water Heater Tank Wrap
- Residential Kit: LEDs, faucet aerator, low flow showerhead

Table 7 provides the Whole House Efficiency Audit program goals compared to actual program performance.

TABLE 7: WHOLE HOUSE EFFICIENCY AUDIT PROGRAM PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation	30	7	23%
Expenditures	$10,350	$1,692	16%
Energy Impacts (kWh)	31,406	4,648.00	15%
Demand Impacts (kW)	3.8	0.43	11%

In PY2018, BHP achieved 23 percent of its participation goal, 15 percent of its energy savings of goals and 11 percent of its demand savings goal, while 16 percent of the budget was spent.

Table 8 provides the Whole House Efficiency program cost-effectiveness analysis results, based on program activity. The program was designed to have lower program costs through a cost sharing arrangement with Montana-Dakota Utilities ("MDU"). A third-party contractor completed 7 audits where the cost was split between BHP and MDU for electric and gas homes. Zero audits were performed on propane heated and total electric homes due to not having access to an available contractor to complete the audits. For PY2019, the company will provide additional marketing efforts to increase participation. While this program falls under the 1.0 cost effectiveness threshold, the Company feels it is necessary to continue this program because it educates customers on future energy efficiency equipment choices when the time for replacement arises.

TABLE 8: WHOLE HOUSE EFFICIENCY PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	0.64
Utility Cost Test	0.64
Societal Cost Test	0.87
Participant Test	n/a
Ratepayer Impact Measure Test	0.16

Whole House Efficiency Program – Highlights and Challenges

In PY2018, the Whole House Efficiency program experienced lower than anticipated participation. The Company will aggressively market this program through our existing trade ally network. The Company is considering a neighborhood outreach effort to gauge success using that approach.

School-Based Energy Education Program

The School-Based Energy Education program seeks long-term energy savings through enhanced education and awareness of energy efficiency among fifth grade students within BHP's service territory. Students participated in a classroom lesson plan and each student received a kit of low-cost energy savings measures at no cost. The kits are designed to help each student understand energy efficiency ideas and concepts, provide each student with hands-on methods related to energy and conservation. The kit included: high efficiency showerhead, kitchen faucet aerator, filter tone alarm, a LED light bulb, a night light, a measuring tape, a refrigerator digital temperature and other items associated with the student's homework assignment.

Table 11 provides the School-Based Education program goals compared to actual program performance.

TABLE 11: SCHOOL-BASED EDUCATION PROGRAM PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation	1,200	1,180	98%
Expenditures	$63,150	$52,040	82%
Energy Impacts (kWh)	476,400	468,460	98%
Demand Impacts (kW)	48.0	47.2	98%

In PY2018, BHP captured 98 percent of participation, energy and demand savings while spending 82 percent of budgeted dollars.

Table 12 provides the School-Based program cost-effectiveness analysis results, based on program activity.

TABLE 12: SCHOOL-BASED EDUCATION PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	1.24
Utility Cost Test	1.24
Societal Cost Test	1.69
Participant Test	n/a
Ratepayer Impact Measure Test	0.19

School-Based Education Program – Highlights and Challenges

The School-Based Energy Education program continues to be a very popular program among schools within BHP's service territory. BHP receives positive comments from participating students, teachers and parents. The Company was able to reduce the cost of the kits which drove the total resource cost test up from 0.82 in PY2017 to 1.24 in PY2018.

Combined Residential Program Portfolio Cost-Effectiveness

Table 15 provides the Combined Residential program cost-effectiveness of all residential programs.

TABLE 15: COMBINED RESIDENTIAL PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	0.88
Utility Cost Test	1.30
Societal Cost Test	1.21
Participant Test	8.45
Ratepayer Impact Measure Test	0.19

Commercial & Industrial Programs

BHP's Commercial & Industrial energy efficiency programs encourage the purchase and installation of energy efficient equipment by providing incentives to lower the cost of purchasing efficient equipment for commercial and industrial facilities.

Commercial Prescriptive Rebate Program

The Commercial Prescriptive Rebate program provides pre-qualified prescriptive rebates for retrofits. The rebated measures include lighting, HVAC equipment, and motors with proven technologies that are readily available with known performance characteristics. The same customer can participate in more than one measure during the same program year. A $25,000 incentive cap is imposed per facility per program year. Multiple rebate applications for different measures may be submitted.

Table 16 provides the Commercial Prescriptive Rebate program goals compare to actual program performance.

TABLE 16: COMMERCIAL PRESCRIPTIVE PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation			
Lighting (Per Bulb)	3,030	1,665	55%
HVAC	8	1	13%
Expenditures	$97,118	$48,956	50%
Energy Impacts (kWh)	1,369,713	407,275	30%
Demand Impacts (kW)	347.8	100.5	29%

In PY2018, BHP spent approximately 50 percent of its budget and achieved approximately 30 percent of its energy and demand savings goals. Over 99 percent of the program impacts were attributed to lighting measures and conversion to LEDs.

Table 17 provides the Commercial Prescriptive Rebate program cost-effectiveness analysis, based on program activity.

TABLE 17: COMMERCIAL PRESCRIPTIVE PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	1.02
Utility Cost Test	2.02
Societal Cost Test	1.35
Participant Test	4.88
Ratepayer Impact Measure Test	0.27

Commercial Prescriptive Rebate Program – Highlights and Challenges

This program helped increase the awareness of LED lighting and the associated savings. There are still many BHP customers needing LED lights so the program will continue to be very visible in the public. Most of the Company's efforts are spent with trade ally education and outreach.

The challenges that were experienced in the program were primarily when customers did not realize the anticipated energy savings in their electric bills. Some of these customers are counting on the energy

savings to contribute to the payback of the LED system. The lighting estimator can assure project savings if they take the time to verify the working conditions of the existing lights, hours of operation in different parts of the building and LED replacement options. The Company has developed a worksheet to document the savings and the associated hours of operation of the lighting equipment to support payback calculations.

The Company has over 100+ projects that have been preapproved and will be rebated in PY2019. Many of these projects came in late in PY2018 due to a significant push in our trade ally network. While underspent the Company will continue to dedicate resources to better educate our trade allies.

Commercial Custom Rebate Program

The Commercial Customer Rebate program offers rebates to commercial and industrial customers that install equipment outside of any prescriptive approved measure. Applications must be pre-approved by BHP before equipment is purchased and installed to ensure the installed equipment produces a TRC benefit-cost test of 1.0 or higher and have incremental payback greater than two years. Incentives were the lesser of the following:

- A buy-down to a two-year payback; or
- 50 percent of the incremental cost

The same customer can participate in more than one measure in the same year. A $25,000 incentive cap is imposed per facility per program year. Multiple rebate applications for different measures may be submitted.

Table 18 provides the Commercial Custom Rebate program goals compared to actual program performance.

TABLE 18: COMMERCIAL CUSTOM PROGRAM PY2018 SUMMARY

	Goal	Actual	% Goal Achieved
Participation	88	63	72%
Expenditures	$444,910	$664,305	149%
Energy Impacts (kWh)	2,883,917	3,578,902	124%
Demand Impacts (kW)	698.7	609.2	87%

In PY2018, the program spent approximately 149 percent of the approved budget. The program achieved 124 percent of its energy savings goal and 87 percent of its demand savings goal. LED lighting conversions were the main activity experienced within this program.

Table 19 provides the Commercial Customer program cost-effectiveness analysis results, based on program activity.

TABLE 19: COMMERCIAL CUSTOM PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	1.66
Utility Cost Test	1.70
Societal Cost Test	2.22
Participant Test	8.60
Ratepayer Impact Measure Test	0.25

Commercial Custom Rebate Program – Highlights and Challenges

LED lighting drove participation in this program. Trade allies have embraced the Commercial Custom Rebate program and the Company will continue its formalized outreach and education efforts to drive further participation. The Company is also engaged their internal marketing and business development team to better promote this program throughout the territory.

Combined Commercial Program Portfolio Cost-Effectiveness

Table 20 provides the Combined Commercial program cost-effectiveness.

TABLE 20: COMBINED COMMERCIAL PROGRAM COST-EFFECTIVENESS RESULTS

Test	PY2018
Total Resource Cost Test	1.58
Utility Cost Test	1.73
Societal Cost Test	2.11
Participant Test	8.14
Ratepayer Impact Measure Test	0.25