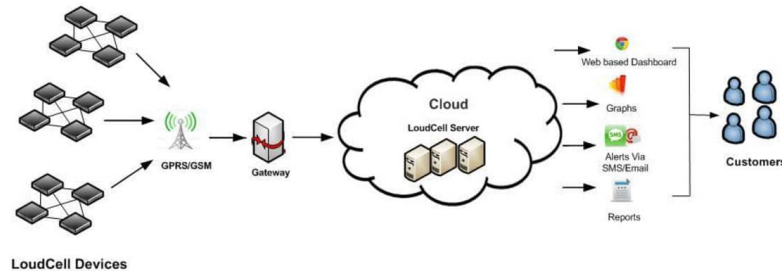
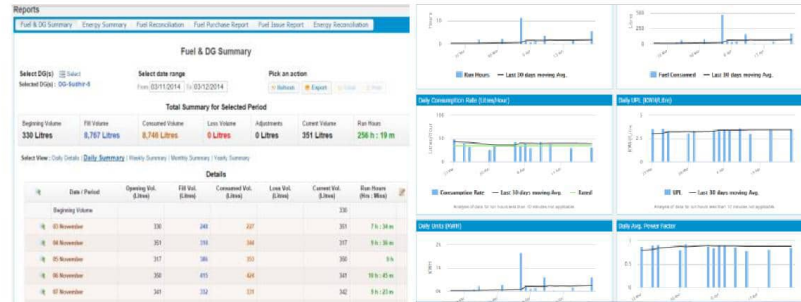


IoT and Cloud based Data Analytics to Save Energy



LOUDCELL

- Young technology startup gaining recognition
 - Your Story.in : India Tech Sparks TECH30 award
 - Red Herring : Asia Top 100 award
 - Top 30 B2B startup Award by IBM
 - TiE Cleantech Winner
 - TiE Lumis : top 6
 - NASSCOM : Emerge 50
- In-house, state-of-the-art, patentable technology
- Presence in India, US (HQ)
- Focus on Fuel Management And Energy
 - helping customers save money, diesel & environment
- Proficient Operations and Sales team.
- Solid Engg. team in HW, SW, Embedded, Web domains
- Installations pan India. Pilots in Nigeria



LoudCell's IoT platform is conceived to connect:

- ❖ Diesel Generators (currently and other sources in future)
- ❖ Heavy Electrical loads
- ❖ Electricity Grid

to the internet and have detailed data analytics provided for:

- ❖ Diesel consumption and power generation efficiency
- ❖ Diesel fill and consumption reconciliation (control pilferage)
- ❖ Electrical energy reconciliation ($\text{grid} + \text{DG} = \sum \text{Electrical loads}$)

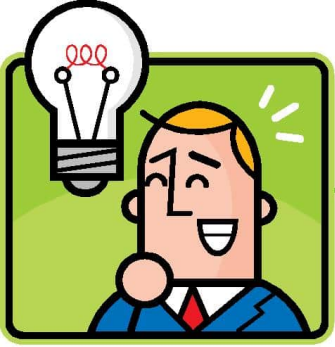
along with alerts and alarms for :

- ❖ large variances of critical parameters,
- ❖ service schedules and
- ❖ predictive analytics

- Our IoT platform addresses wastage in 14B litres of diesel (\$ 10 Billion) burned annually in DGs (17% of total) in India alone.
- 300,000 DGs in NCR, 5 million DGs in India plus Emerging economies (Africa, Lat-Am etc.)

Important Problem: High Economic and Social Impact

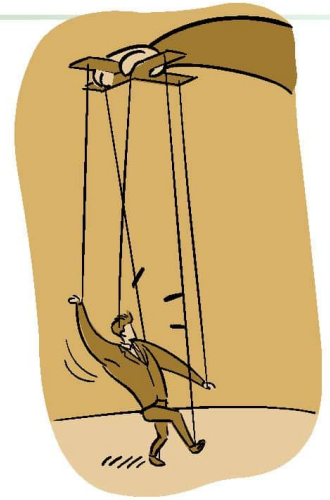
- High operational wastages of fuel
- High DG inefficiencies
- Fuel pilferage
- Diesel fuel costs are high
- Manual data collection and analysis
- Large import bill
- Environmental issues due to carbon emissions



ENERGY WASTAGE FACTS



- Upto 15% savings through improved performance and efficiency by adopting Process Automation
- Upto 15% Diesel loss due to pilferage : National average.
- Loss of Diesel also due to other unproductive means
- 20% of power in Industry is estimated to be wasted
- Abundant breakdowns and Energy Losses due to lack of reliable and real time monitoring/ reporting
- Every watt of energy saved by consumer is worth 2 watts produced



Possible to Monitor and Control only what one can Measure

LoudCell iEMS Overview



iEMS consists of iFMS and iELMS :

❖ iFMS : Intelligent Fuel Management System

- For Diesel Generators and Storage Tanks
- Master Control Unit (MCU) with wireless communication

❖ iELMS : Intelligent Electrical Management System

- For Electrical points viz. grid and loads. Multiport system (4 ports)
- Master Control Unit (MCU) with wireless communication

❖ Combined Integrated Dashboard for iEMS (iFMS + iELMS)

- Online Cloud based application
- To Manage, Monitor and track 24X7



Value Proposition



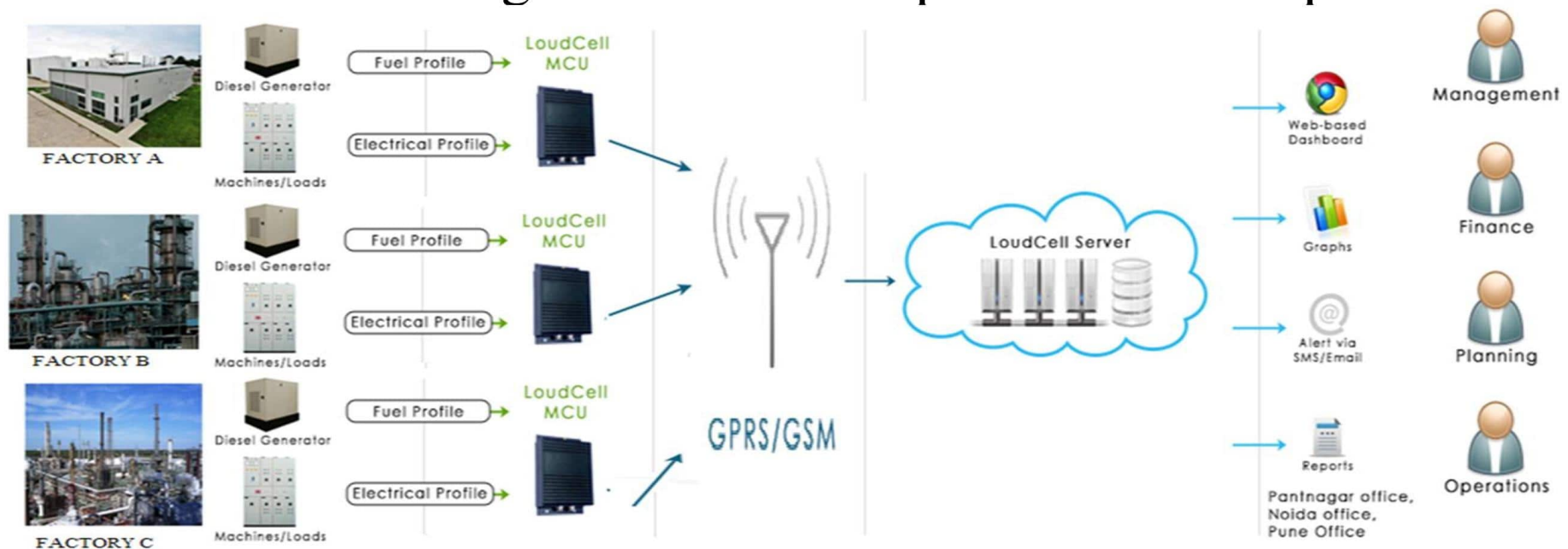
- 24/7 MIS, automated and timely reporting of accurate data
- Cloud based, increased ease of use, tamper resistant HW
- Integrated Customer Energy Management with multiple energy sources
- Save Diesel by reducing operational wastage and control pilferage
 - complete visibility in DG running/fuel usage
 - Actionable business intelligence and alerts e.g. idle running of DG, underutilization of DG
 - efficiency, units generated per litre of diesel used

Every bit of Diesel and Energy saved is Nature saved

LoudCell Technology



- IoT, field installed, Internet connected smart sensors & hardware
- Cloud based, data analytics, highly scalable
- Proprietary technology, dashboards, reports, alerts
- Tamper resistant rugged, reliable hardware
- Very high entry barriers for technology development
- Uses machine learning and solves complex non-trivial problems



Key Customers



Shopping as it should be



Africa (Nigeria)



Key Customers




Express Engineers



Roop Polymers



DG Energy & Fuel Summary LOUDCELL

 **LoudCell Dashboard**

DASHBOARD
SITE ▾
DG ▾
SETUP ▾
LOG OUT

Welcome, LoudCell Support | [Preferences](#)

Site - Unit-I

Reports

Fuel & DG Summary
Energy Summary
Fuel Reconciliation
Fuel Purchase Report
Fuel Issue Report
Energy Reconciliation

Select EM(s) for :

Select date range
From To

Pick an action

Selected Item(s) :
DG-Unit-I DG-2












Filter by Shift :

Total Summary for Selected Period

Total Time	Volume Consumed	Units	Average Current	Peak Current	Average Power Factor	Units/Litre
12 h : 34 m	617 Litres	1,943 KWH	250 Amps	301 Amps	0.83	3.1 KWH/Litre

Select View : [Daily Details](#) | [Daily Summary](#) | [Weekly Summary](#) | [Monthly Summary](#) | [Yearly Summary](#)

Details

	Date / Period	Total Time (Hrs : Mins)	Volume Consumed (Litres)	Units (KWH)	Avg Current (Amps)	Peak Current (Amps)	Avg Power Factor	Units/Litre (KWH/Litre)
	30 January	3 h : 32 m	175	542	251	287	0.85	3.1
	02 February	30 m	24	73	228	277	0.78	3.0
	05 February	17 m	14	46	247	301	0.74	3.4
	09 February	28 m	25	64	228	253	0.80	2.5
	10 February	2 h : 41 m	136	442	267	296	0.84	3.2
	11 February	1 h : 39 m	79	249	252	276	0.86	3.2
	13 February	1 h : 48 m	81	274	242	296	0.82	3.4
	16 February	1 h : 01 m	48	141	241	281	0.80	3.0
	21 February	27 m	23	70	236	273	0.80	3.1
	23 February	17 m	14	43	234	268	0.78	3.1
GRAND TOTAL		12 h : 34 m	617	1,943	250	301	0.83	3.1

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Energy reconciliation



LoudCell Dashboard

DASHBOARD
SITE ▾
DG ▾
SETUP ▾
LOG OUT

Welcome, LoudCell Support | Preferences

Reports

Fuel & DG Summary
Energy Summary
Fuel Reconciliation
Fuel Purchase Report
Fuel Issue Report
Energy Reconciliation

Site - Unit-I

Energy Reconciliation

Select Source : Select
Selected Item(s) :
Unit-I UPCL, DG-Unit-I DG-1, DG-Unit-I DG-2

Select date range :
From To
Filter by Shift :

Select Loads : Select
Selected Item(s) :
Unit-I APDB, Unit-I APDB-2, Unit-I Assembly, Unit-I Compressor, Unit-I Die Casting, Unit-I HVAC-1, Unit-I HVAC-2, Unit-I Main Light, Unit-I PaintShop-1, Unit-I PaintShop-2, Unit-I PDB-1, Unit-I PDBA-3 (Office Light), Unit-I PowderCoating-1, Unit-I PowderCoating-2, Unit-I Tool Room, Unit-I Utility-3

Pick an action

Select View : Daily Details | Daily Summary | Weekly Summary | Monthly Summary | Yearly Summary
* All data for KWH has been derived from KVAH and power factor.

Date / Period	SOURCE				LOAD												
	Unit-I UPCL Units (KWH)	DG-Unit-I DG-1 Units (KWH)	DG-Unit-I DG-2 Units (KWH)	Total	Unit-I APDB Units (KWH)	Unit-I APDB-2 Units (KWH)	Unit-I Assembly Units (KWH)	Unit-I Compressor Units (KWH)	Unit-I Die Casting Units (KWH)	Unit-I HVAC-1 Units (KWH)	Unit-I HVAC-2 Units (KWH)	Unit-I Main Light Units (KWH)	Unit-I PaintShop-1 Units (KWH)	Unit-I PaintShop-2 Units (KWH)	Unit-I PDB-1 Units (KWH)	Unit-I PDBA-3 (Office Light) Units (KWH)	
14 February	3,147	0	0	3,147	21	50	124	668	775	0	0	269	63	298	143		
15 February	514	51	0	565	0	0	27	0	50	0	0	193	0	3	16		
16 February	2,962	0	141	3,102	9	14	113	235	759	0	0	303	59	464	121		
17 February	3,162	0	0	3,162	0	0	122	0	820	0	0	306	59	389	100		
18 February	3,183	0	0	3,183	0	0	111	0	762	0	0	291	68	342	135		
19 February	3,238	0	0	3,238	0	0	115	0	718	0	0	291	73	336	137		
20 February	3,321	0	0	3,321	0	0	123	0	686	0	0	311	77	407	112		
21 February	2,964	0	70	3,034	0	0	121	0	585	0	0	295	76	349	84		
22 February	2,958	50	0	3,008	0	0	93	0	690	0	0	272	63	271	60		
23 February	3,170	0	43	3,213	199	326	155	4,971	725	69	0	300	81	284	115		
24 February	3,218	0	0	3,218	26	54	156	559	717	0	0	282	64	342	145		
25 February	1,863	0	0	1,863	9	30	90	275	354	0	0	143	54	232	89		
GRAND TOTAL	33,698	101	254	34,053	264	475	1,349	6,708	7,640	69	0	3,256	738	3,717	1,257	84	

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Fuel reconciliation



LoudCell Dashboard

DASHBOARD
SITE ▾
DG ▾
SETUP ▾
LOG OUT

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Main Tank

Reports
Fuel & DG Summary
Fuel Reconciliation
Fuel Purchase Report
Fuel Issue Report

Fuel Reconciliation

Select Source
☒ Tank-MainTank
☐ Tank-Unit-I DayTank
☐ Tank-Unit-II DayTank

Select date range
 From To
Filter by Shift :

Pick an action

Total Summary for Selected Period

Issued from stock 2,123 Litres	Filled in DGs 2,123 Litres	Difference 0 Litres
--	--------------------------------------	-------------------------------

Select View :
[Daily Details](#)
[Daily Summary](#)
[Weekly Summary](#)
[Monthly Summary](#)
[Yearly Summary](#)

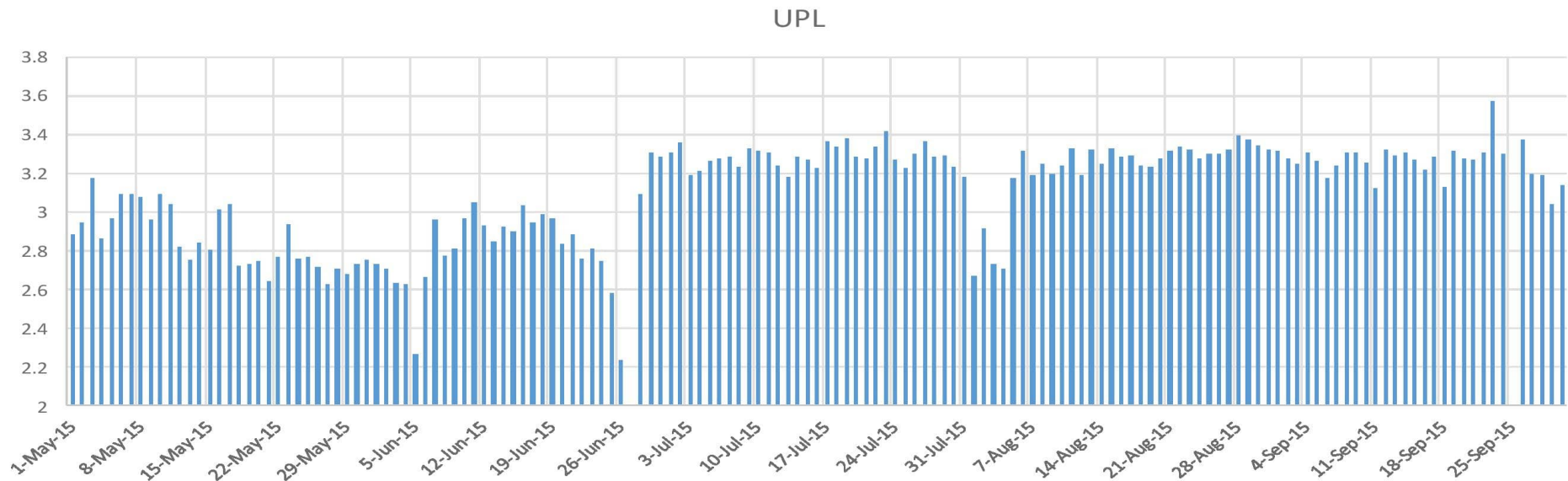
Details

	Date / Period	DG	Issued (Litres)	Filled (Litres)	Difference (Issue - Fill) (Litres)	Cumulative Difference (Issue - Fill) (Litres)	Issued To Person
	30 January		686	686	0	0	
	Morning Shift (6:00 AM to 1:59 PM)		686	686	0	0	
	12:35:32 PM	Tank-Unit-II DayTank		686	-686	-686	
	12:56:10 PM		686		686	0	
	04 February		87	87	0	0	
	Afternoon Shift (2:00 PM to 9:59 PM)		87	87	0	0	
	5:13:31 PM	Tank-Unit-I DayTank		87	-87	-87	
	5:22:20 PM		87		87	0	
	05 February		568	568	0	0	
	Morning Shift (6:00 AM to 1:59 PM)		568	568	0	0	
	10:46:20 AM	Tank-Unit-I DayTank		568	-568	-568	
	11:01:55 AM		568		568	0	
	13 February		781	781	0	0	
	Afternoon Shift (2:00 PM to 9:59 PM)		781	781	0	0	
	5:38:37 PM	Tank-Unit-I DayTank		781	-781	-781	
	5:56:57 PM		781		781	0	
	GRAND TOTAL			2,123	0		

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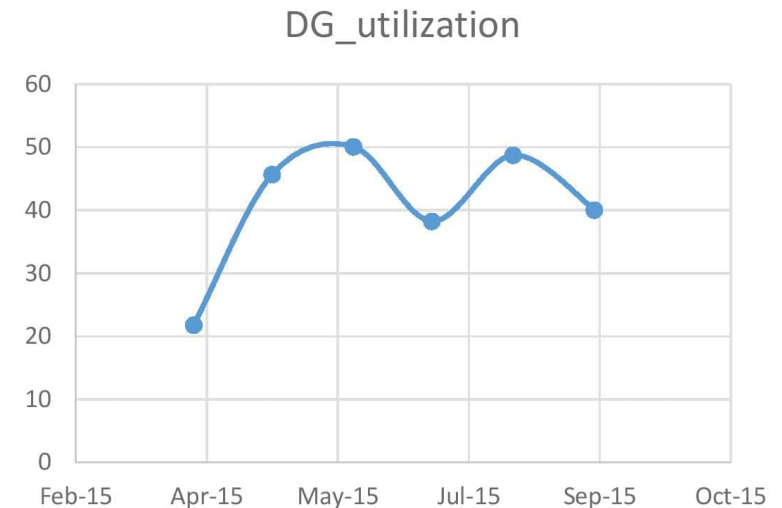
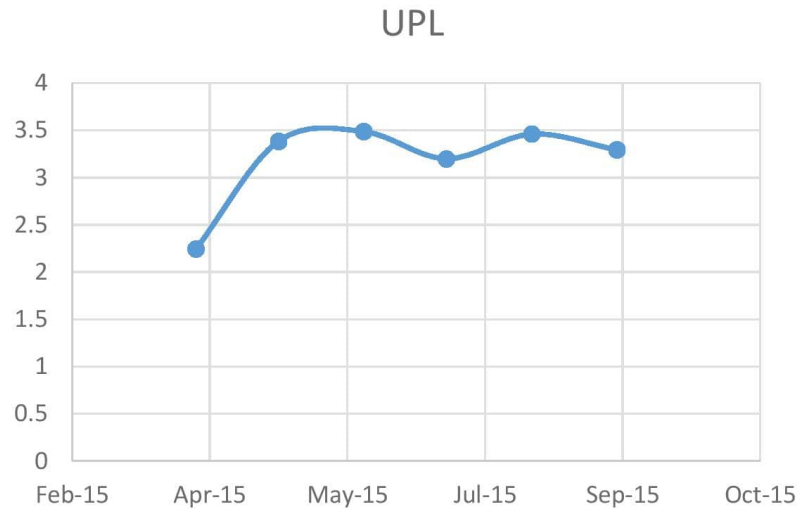
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Customer 1: KWH/Units Per Litre (UPL) Improvement



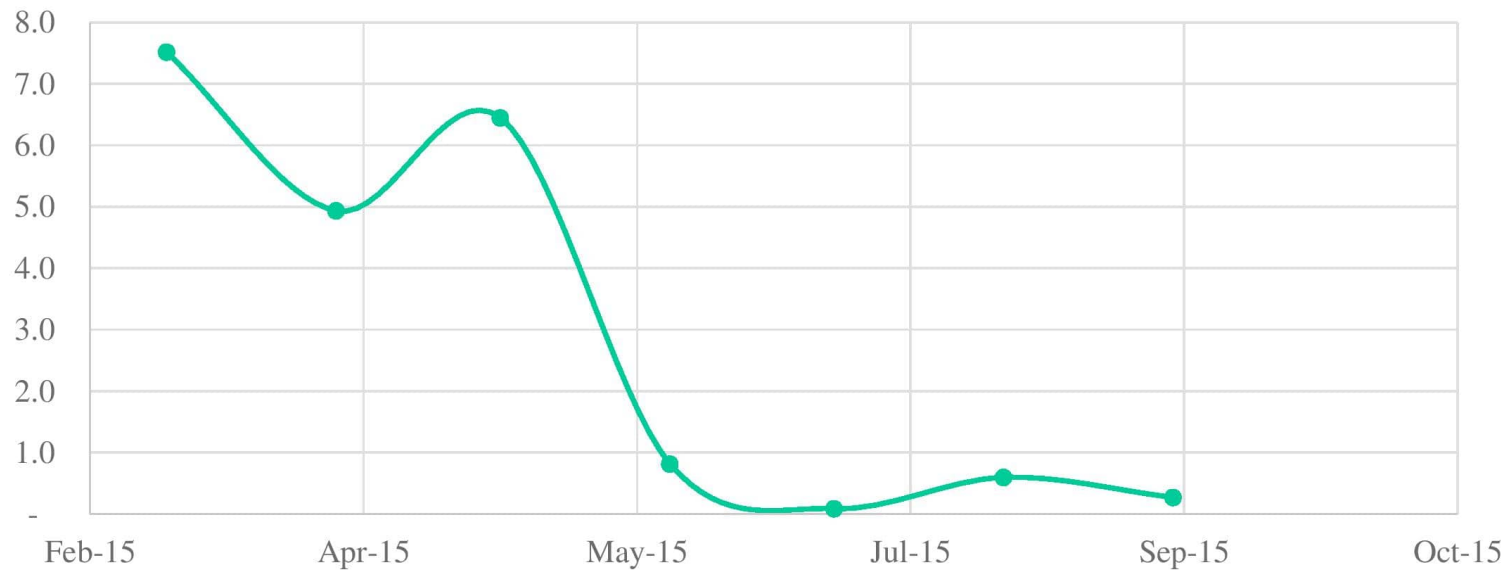
- **DG Rating: 100 KVA**
- UPL increased **from 2.8 units per litre to 3.3 units per litre**
 - 18% improvement
- **Monthly savings of 608 litres per month**
 - Average monthly consumption of 3407 litres at UPL 3.3

Customer 2: DG Utilization and UPL Improvement



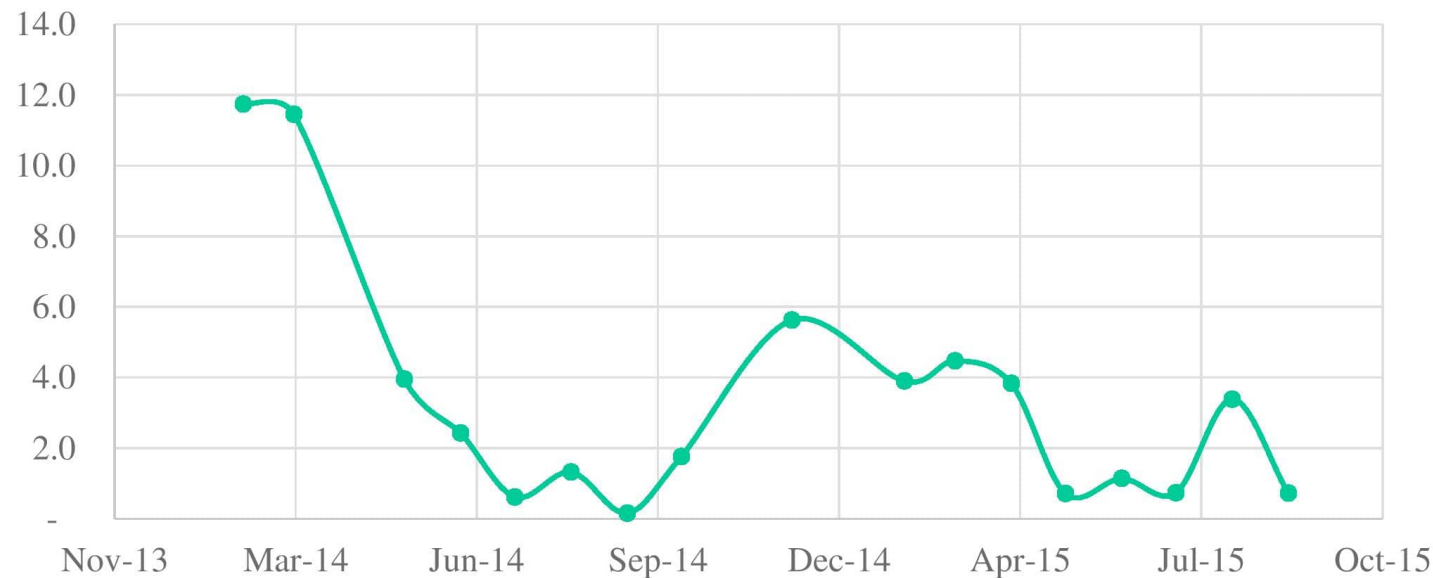
- **DG Rating: 500 KVA**
- UPL increased **from 2.3 units per litre to 3.3 units per litre**
 - 43% improvement
- **Monthly savings of 455 litres per month**
 - Average monthly consumption of 1046 litres at UPL 3.3

Customer 3: Un-productive DG usage on Sundays reduced



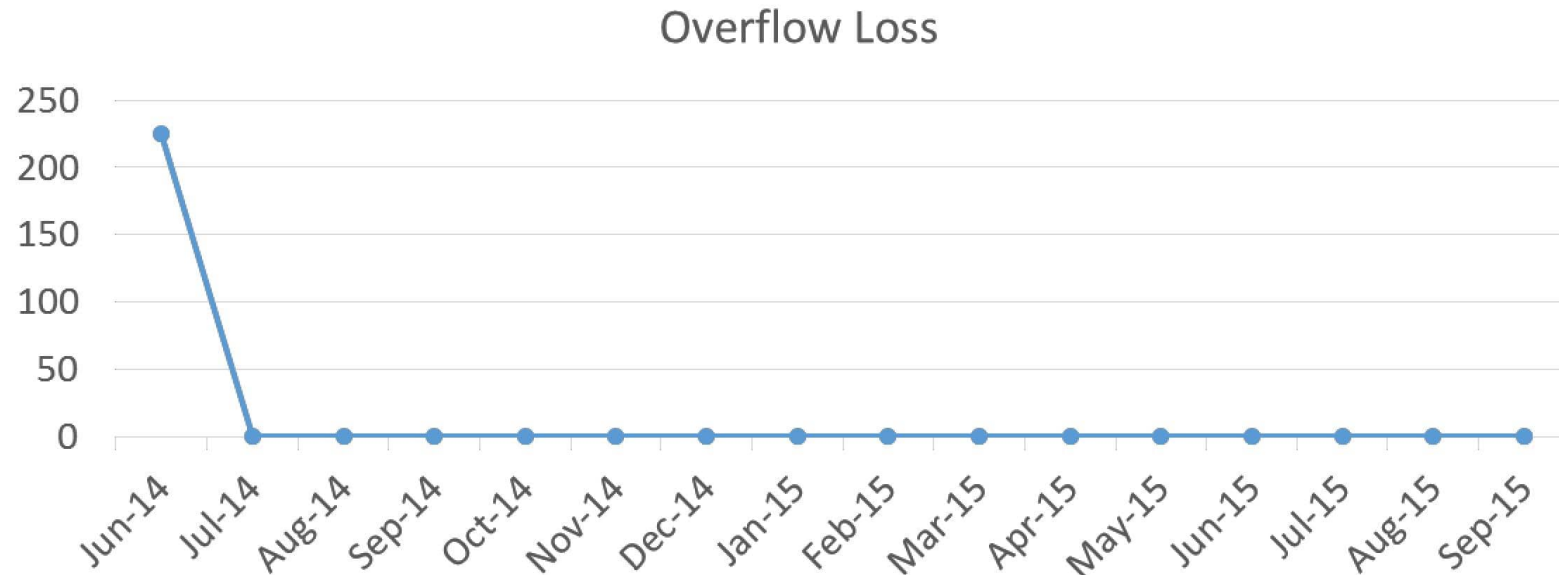
- **DG Rating: 1250 KVA**
- **DG run-hours on Sundays decreased from 6.3 hrs to 0.4 hrs per month**
- **Monthly savings of 800 litres per month**
 - **Average monthly consumption on Sundays reduced from 840 litres to 40 litres**

Customer 4: University DG usage on Sundays reduced



- **DG Rating: 250 KVA**
- **DG run-hours on Sundays decreased from 11.6 hrs to 2.3 hrs per month**
- **Monthly savings of 186 litres per month**
 - **Average monthly consumption on Sundays reduced from 216 litres to 30 litres**

Customer 5: Retail Customer Overflow Loss Eliminated



- Overflow loss during transfer from Tank to DG (unattended, valve malfunction)
- Alerted customer to loss of **more than 200 litres in single instance**
- Such incidents **completely eliminated after alerts to customer**

- Fast and accurate reporting.
- Decentralized and automated data availability.
- Eliminated manual efforts and manual errors.
- Authorized diesel usage identified accurately for DG or other purposes.
- DG battery monitoring providing information for battery health.
- Energy consumption trends and reconciliation.
- Hourly, shift-wise, daily, weekly or monthly reports on your computer anytime any where.
- Data warehousing since inception.

- LoudCell : Strong Recognition and track record in a short span
- iEMS : fully integrated, reliable and easy-to-use system to manage Fuel and Energy across the organization
- LoudCell builds world class, state-of-the-art products using its own patentable technology
 - complete control to manage your requirements

Implement iEMS to build your efficiencies and savings !!!

Every bit of Diesel and Energy saved is Nature saved

Thank You

For more info, please contact:

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