“Real-time Enabling” Your Enterprise Business Systems

Andriy Stephanchuk & Dr. Hendrik Hamann IBM
Michael Appleby & Peter Huyen ……. SAP
Gopal GopalKrishnan, P.E. …….OSIsoft

Enterprise Integration and PI Data Access

Production Maintenance Quality

Compliance Reporting Lab Calibration

ERP and Asset Management Systems

XML

OPC FOUNDATION

Java

SAP

IBM

ORACLE

INFOR

ISO

IFS

OSIsoft.

MINCOM

Ventyx

CA.GOV

PI Data Access

PI Web Services 2010

PI OLEDB Enterprise 2010

PI JDBC 2010

PI OPC

PI Notification - Delivery Channels

PI SDK, AF SDK, AN SDK

End User Licensing :PI System Access (PSA)

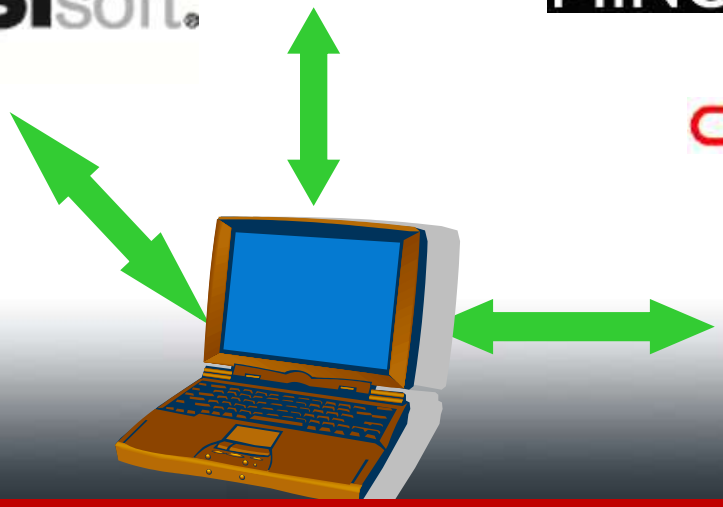
Developer Licensing : vCampus Subscription

Aspects of Enterprise Business Integration

Data

Events

Visualization



Push vs. Pull + optional Middleware

- PI Data/Events
  - Push 

vs. Pull 

  - None

  - Microsoft BizTalk
  - SAP MII (and PCo)
  - IBM Websphere ESB
  - Oracle Fusion
  - TIBCO
  - . . . . . .

Use Cases and Demos

- MMT (Mobile Management Technology)
  - PI SDK (polling now, later migrate to sign-up for update)
- Cognos (Green Sigma initiative)
  - PI JDBC (via Tivoli Agent) to Tivoli Data Warehouse

- Business Objects – Xcelsius
- Carbon Impact (CI)

- SAP ERP (Production PP/PI, Maintenance PM, Quality QM)
  - All Integration using SAP MII
    - » Uses XML – you supply or it generates from PI data

IBM MMT

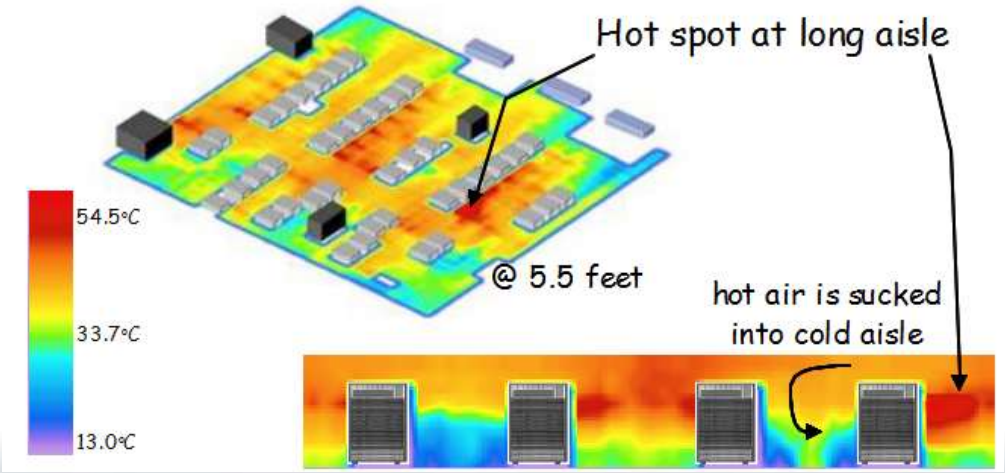
IBM MMT Agenda

- MMT Introduction
- PI – MMT Integration
  - MMT Architecture
  - Integrated Modeling Environment
  - PI data feeds
- PI enabled Analytics
  - PI data visualization in MMT
  - Power and Heat Distributions
  - Asset management
- Conclusion

MMT Introduction

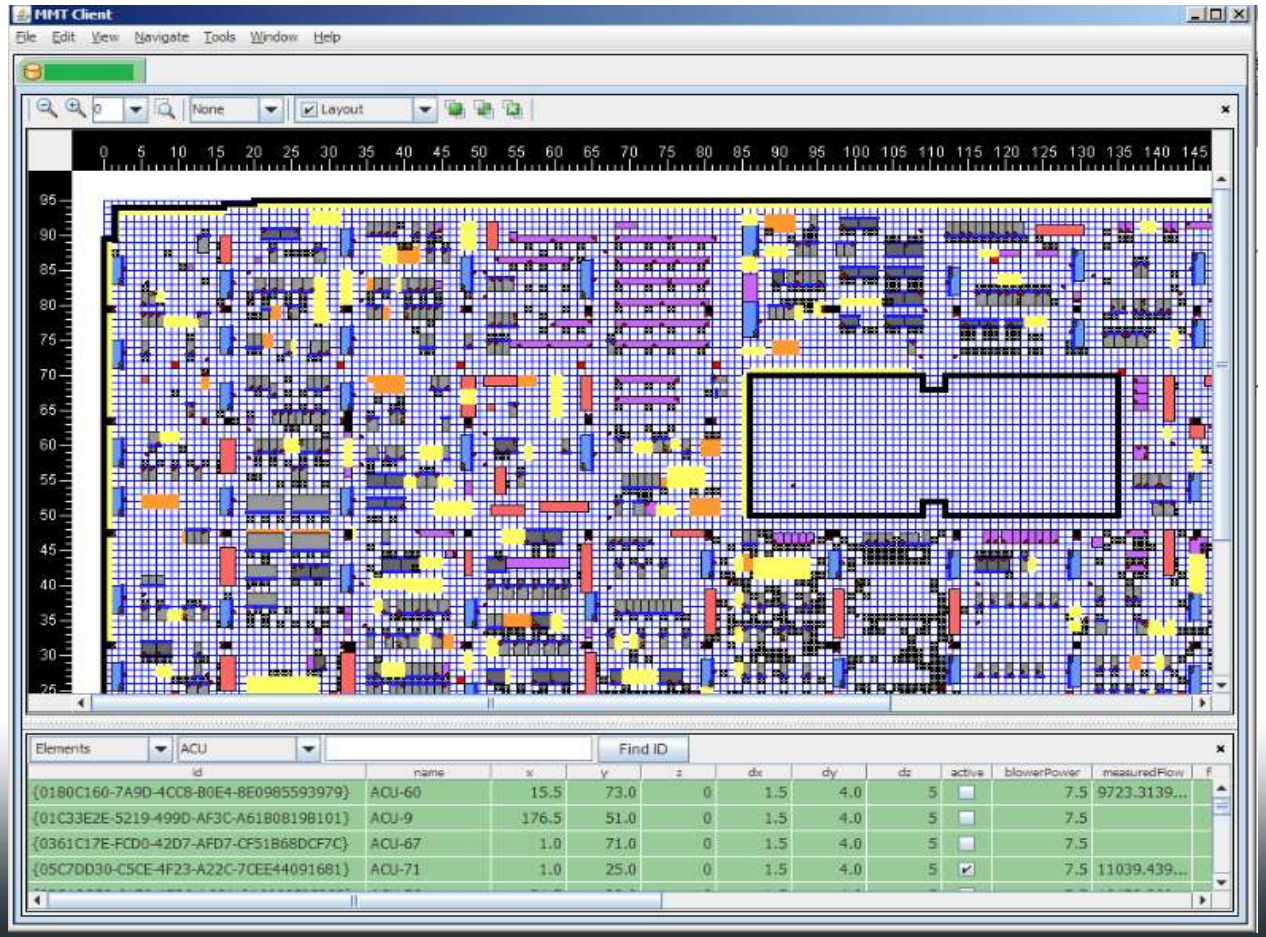
Mobile Measurement Technology

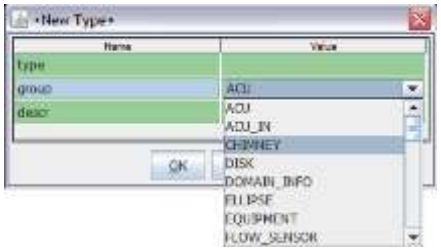
Optimize data center thermal profile to reduce energy consumption.

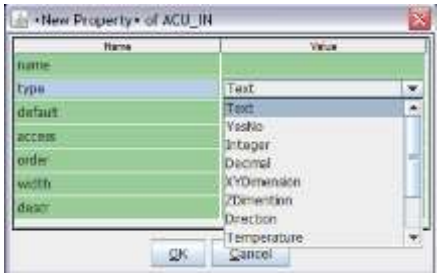


MMT Introduction

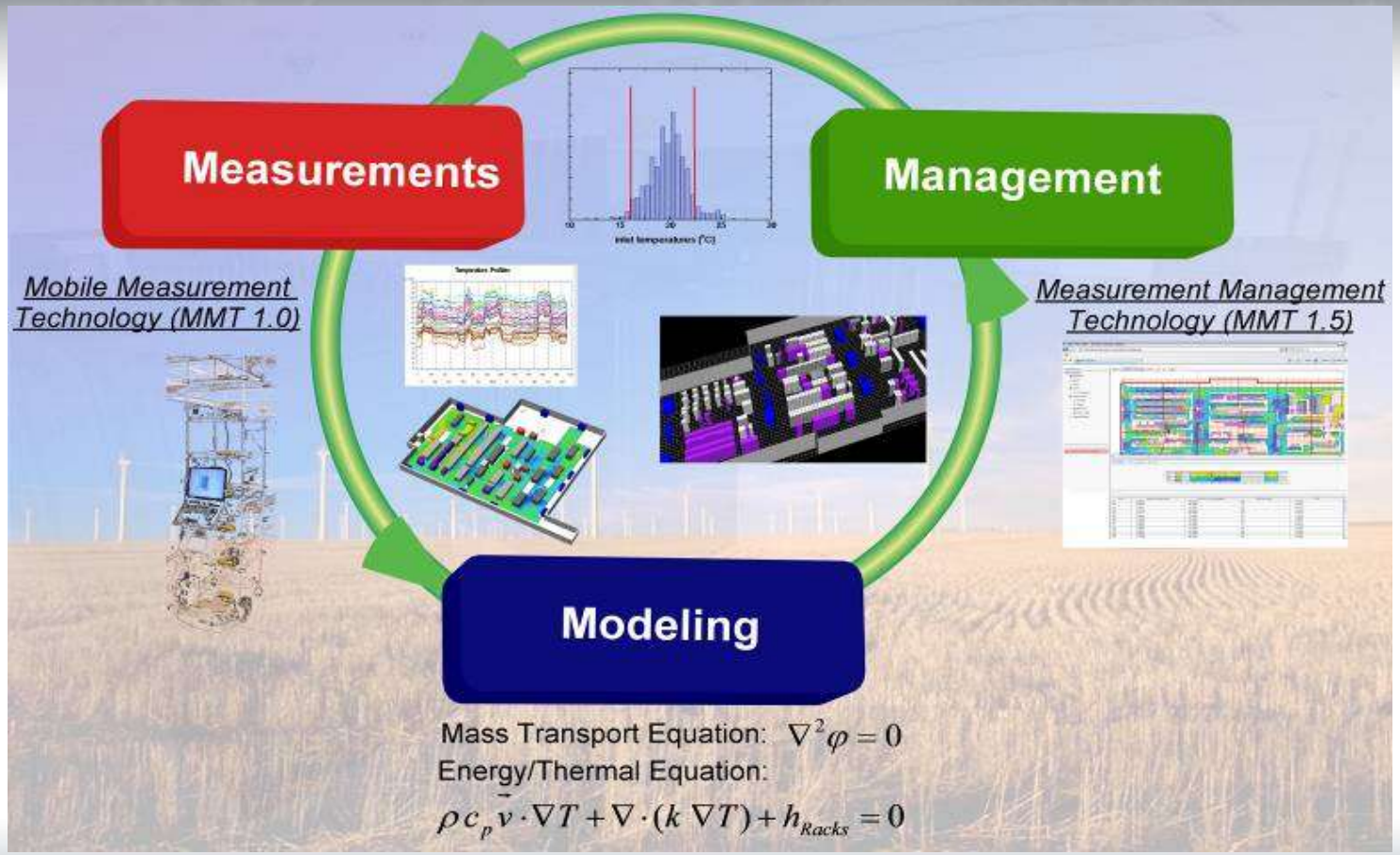
Data Model Manager – defines different types and their properties:







Next step – Real-time MMT



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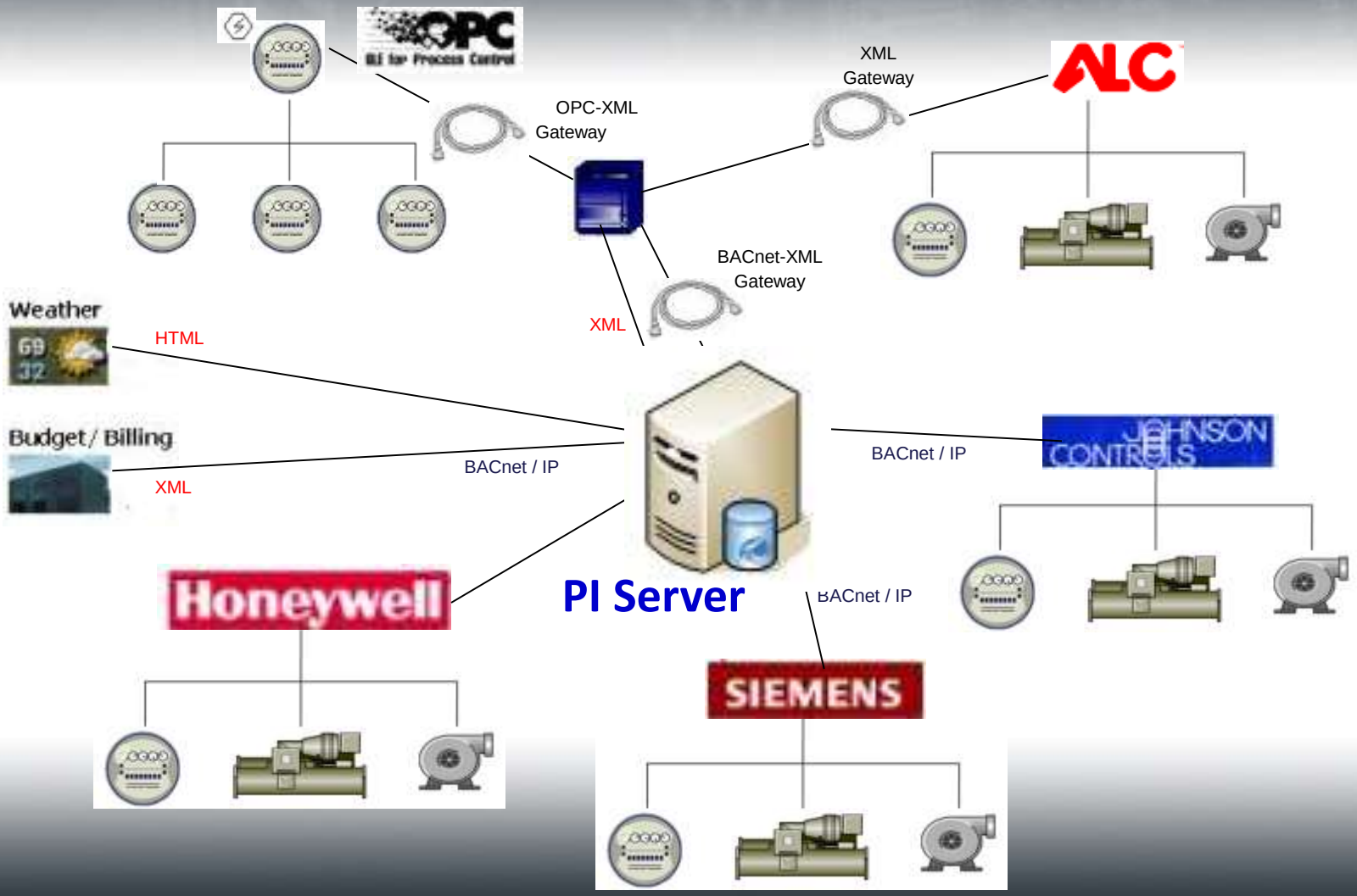
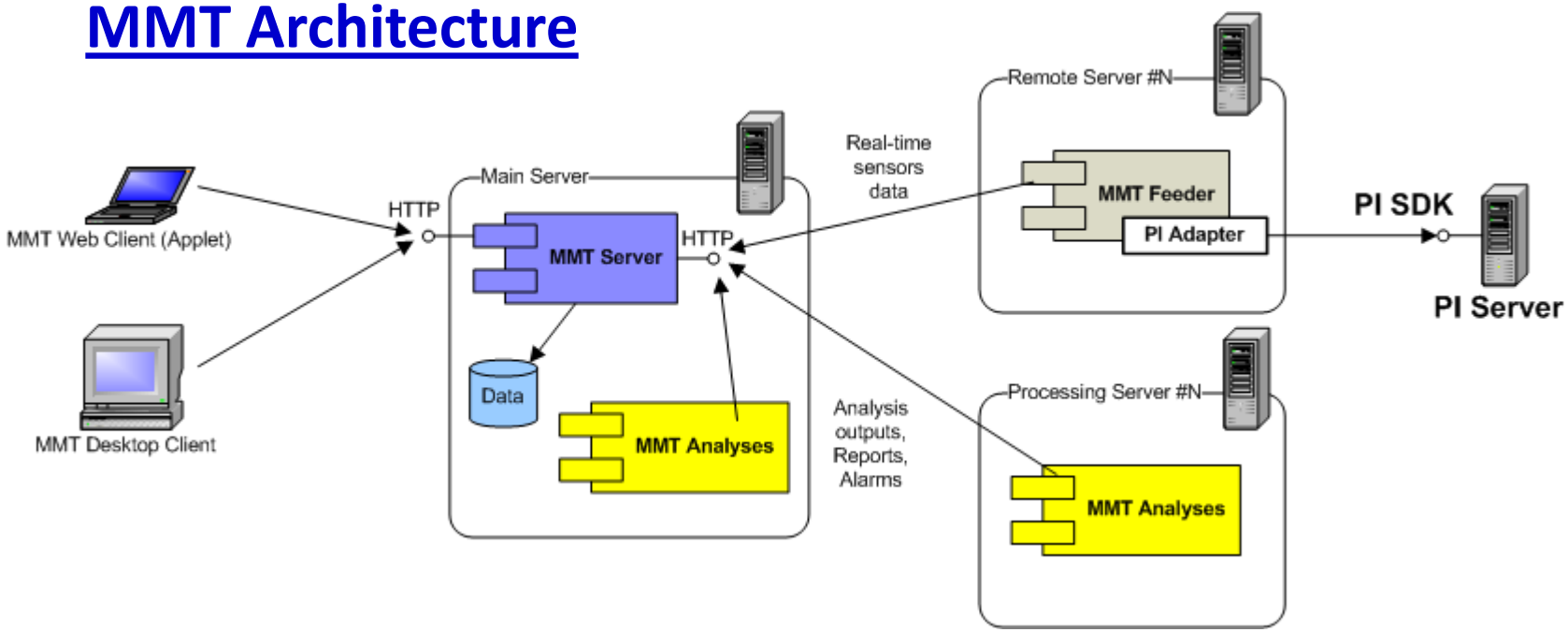
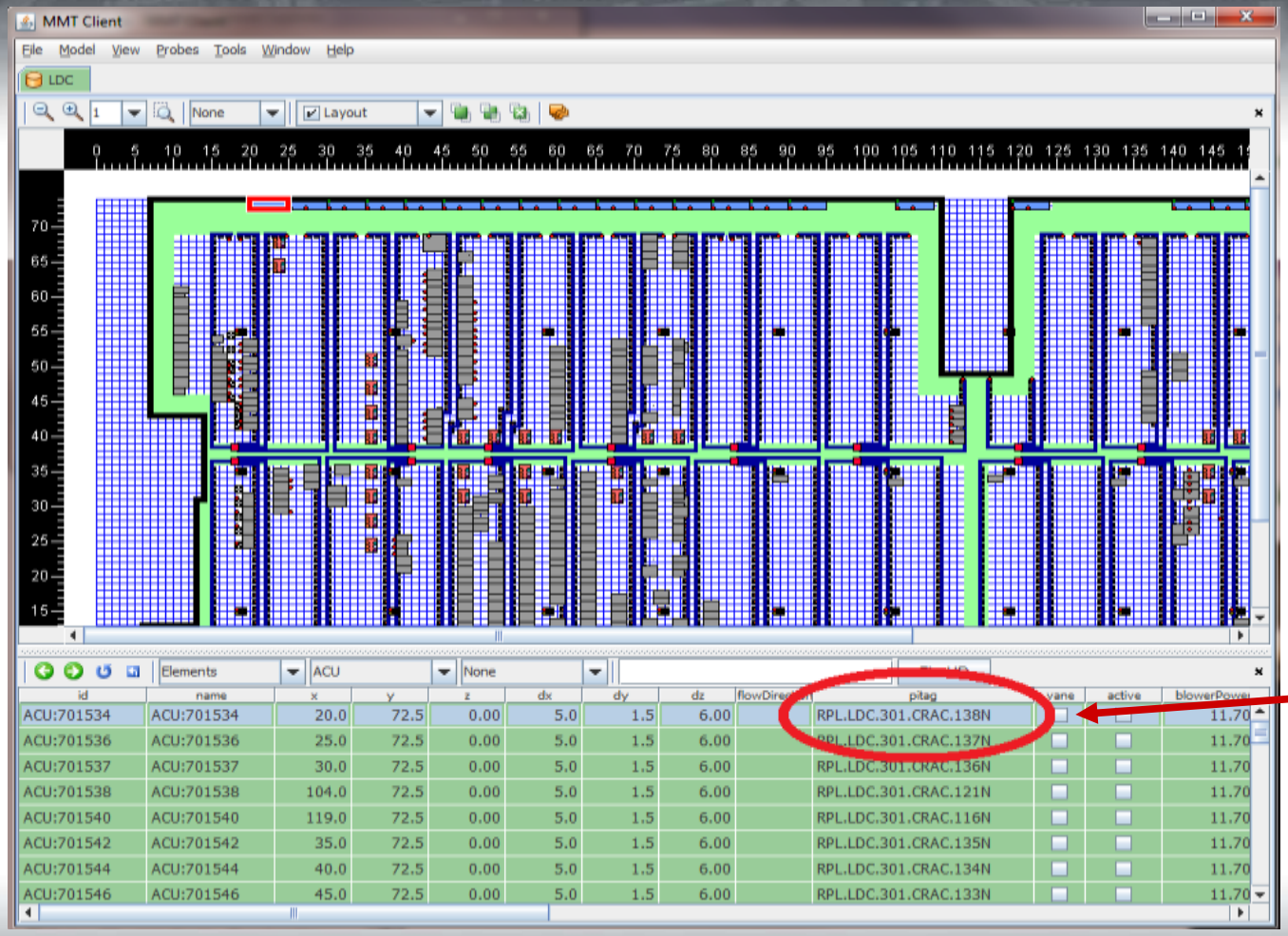


PI-MMT Integration

MMT Architecture



PI data feeds



Configure
PI Adapter

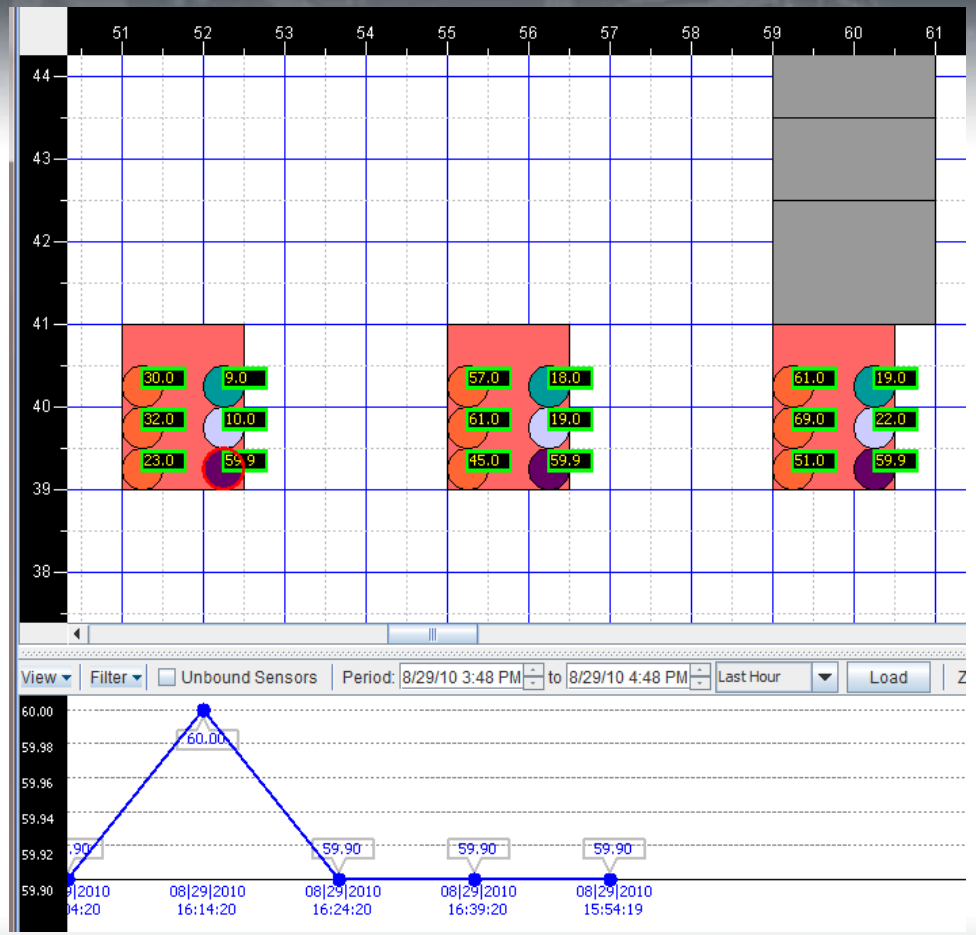
PI data feeds

CRAC Points:

- Fan speed
- Return temperature
- Supply temperature

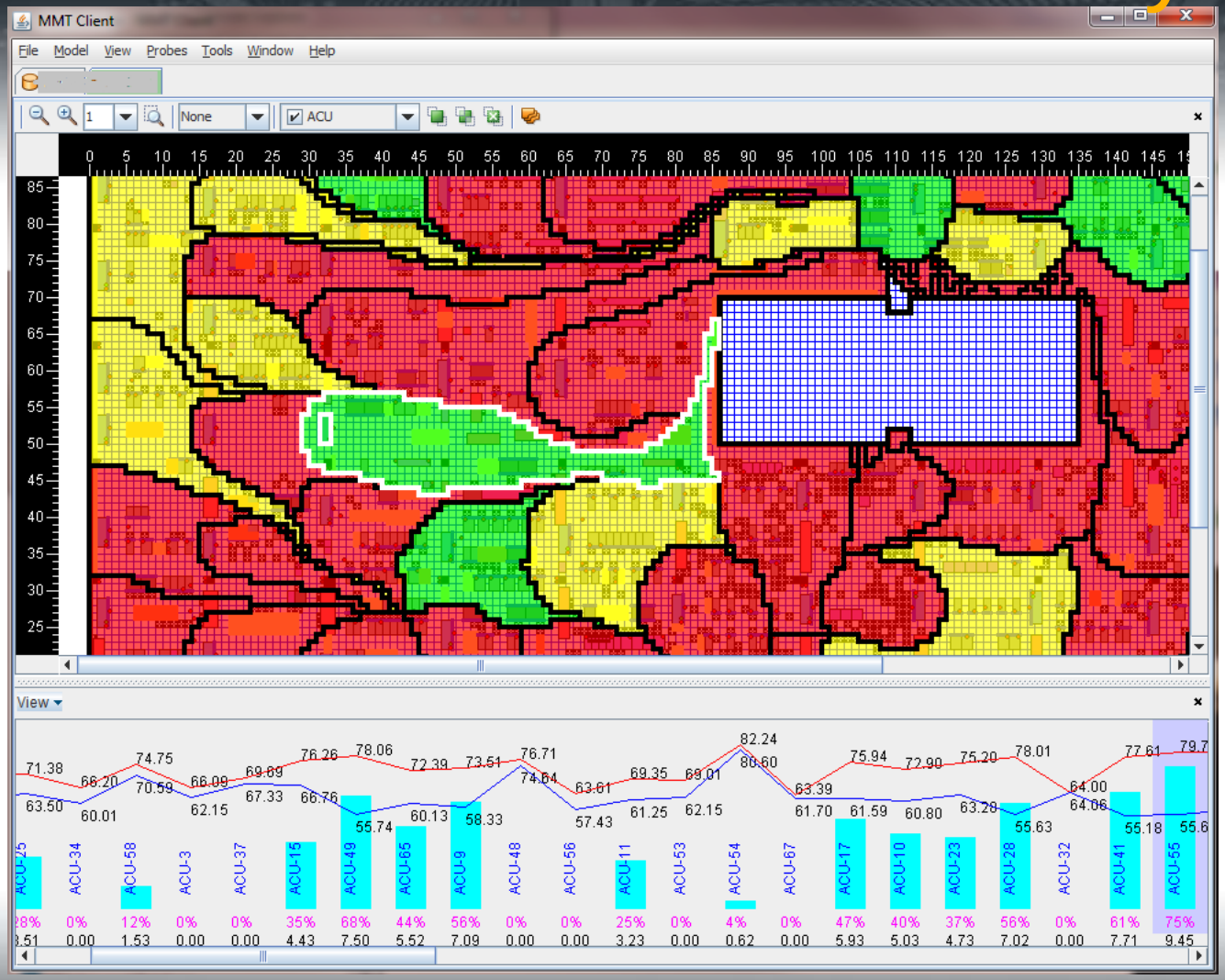
PDU Points:

- Current A,B,C
- Voltage AB, BC, CA
- Total Power
- … panels and circuits

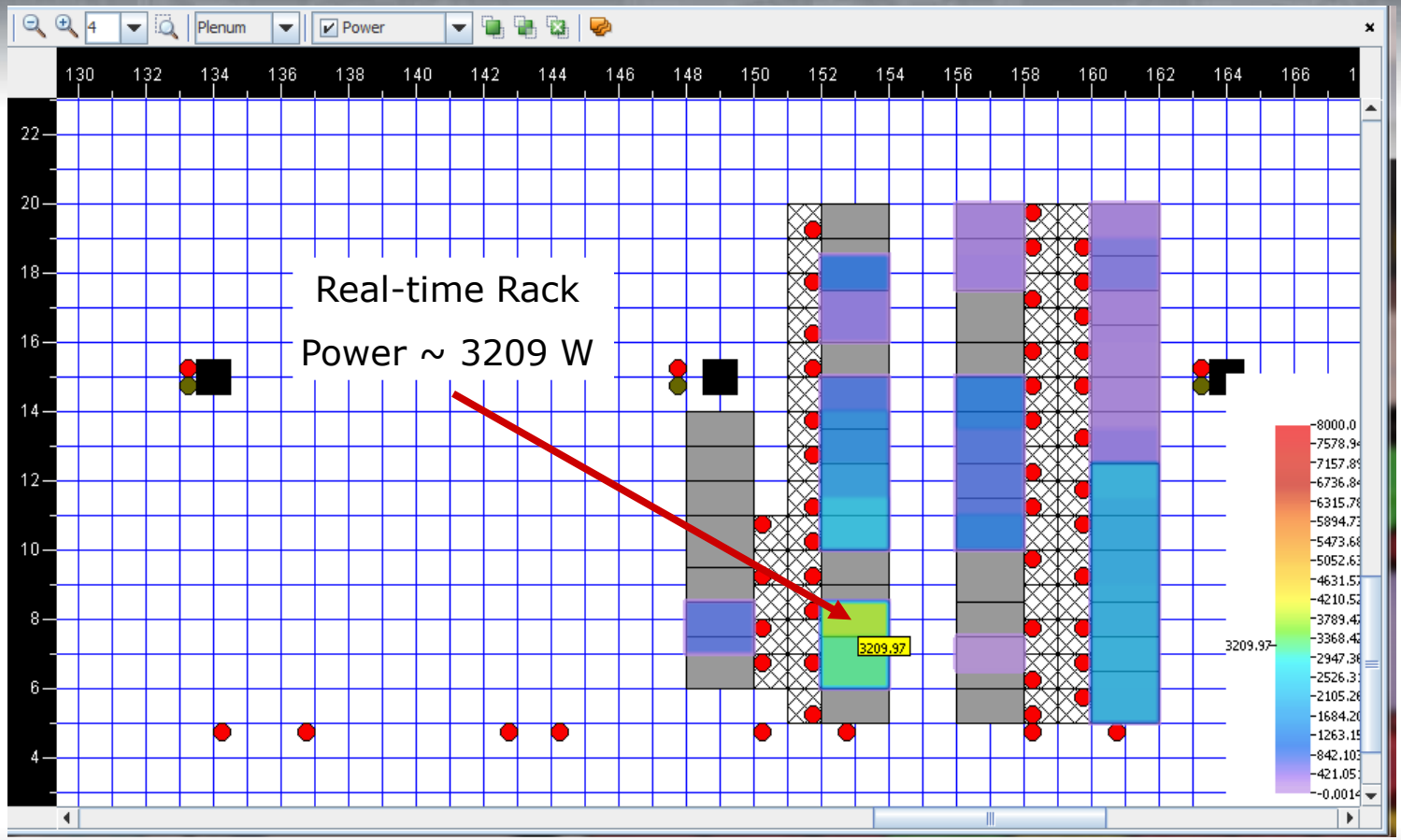


PI data visualization in MMT

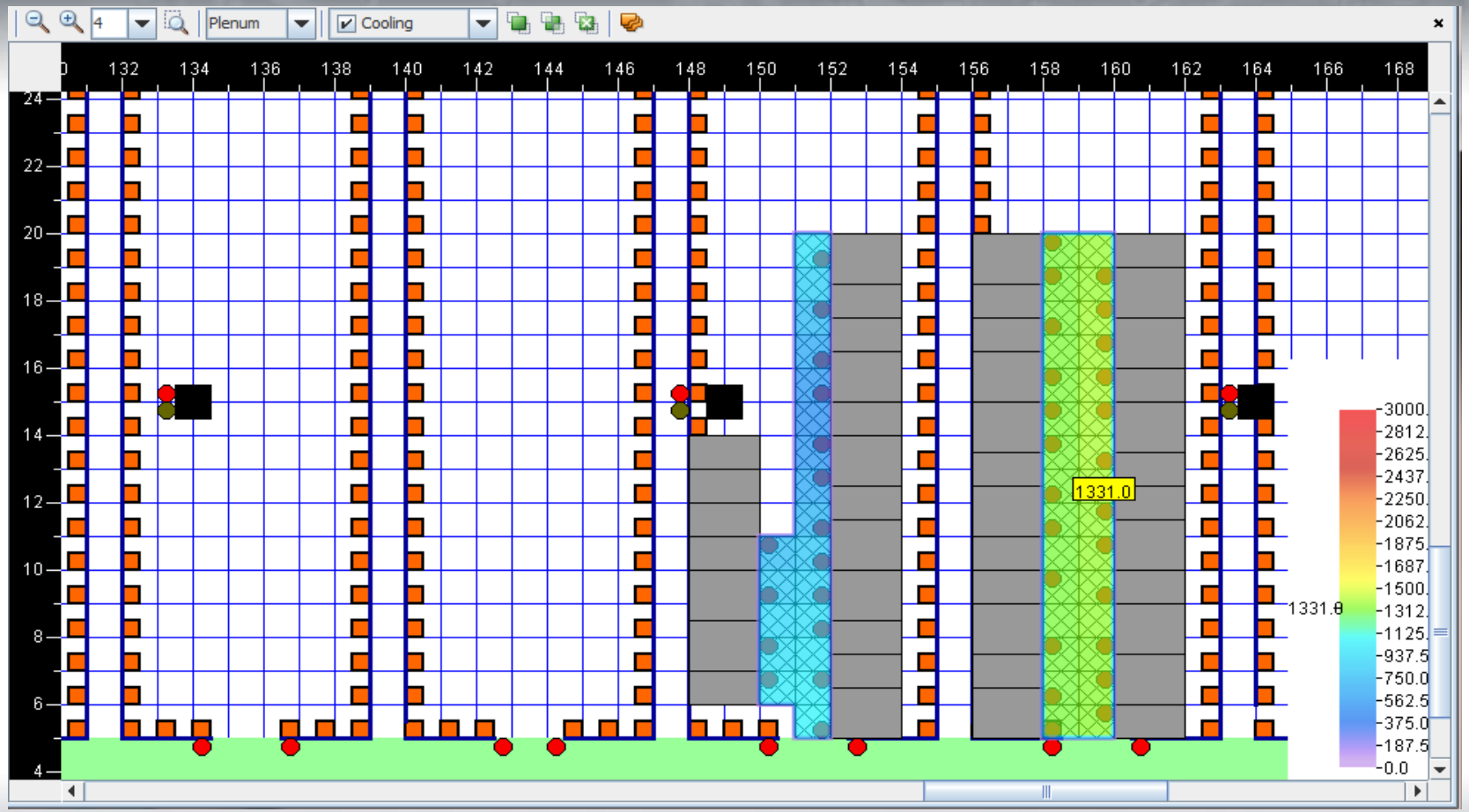
CRAC Zones & Efficiency



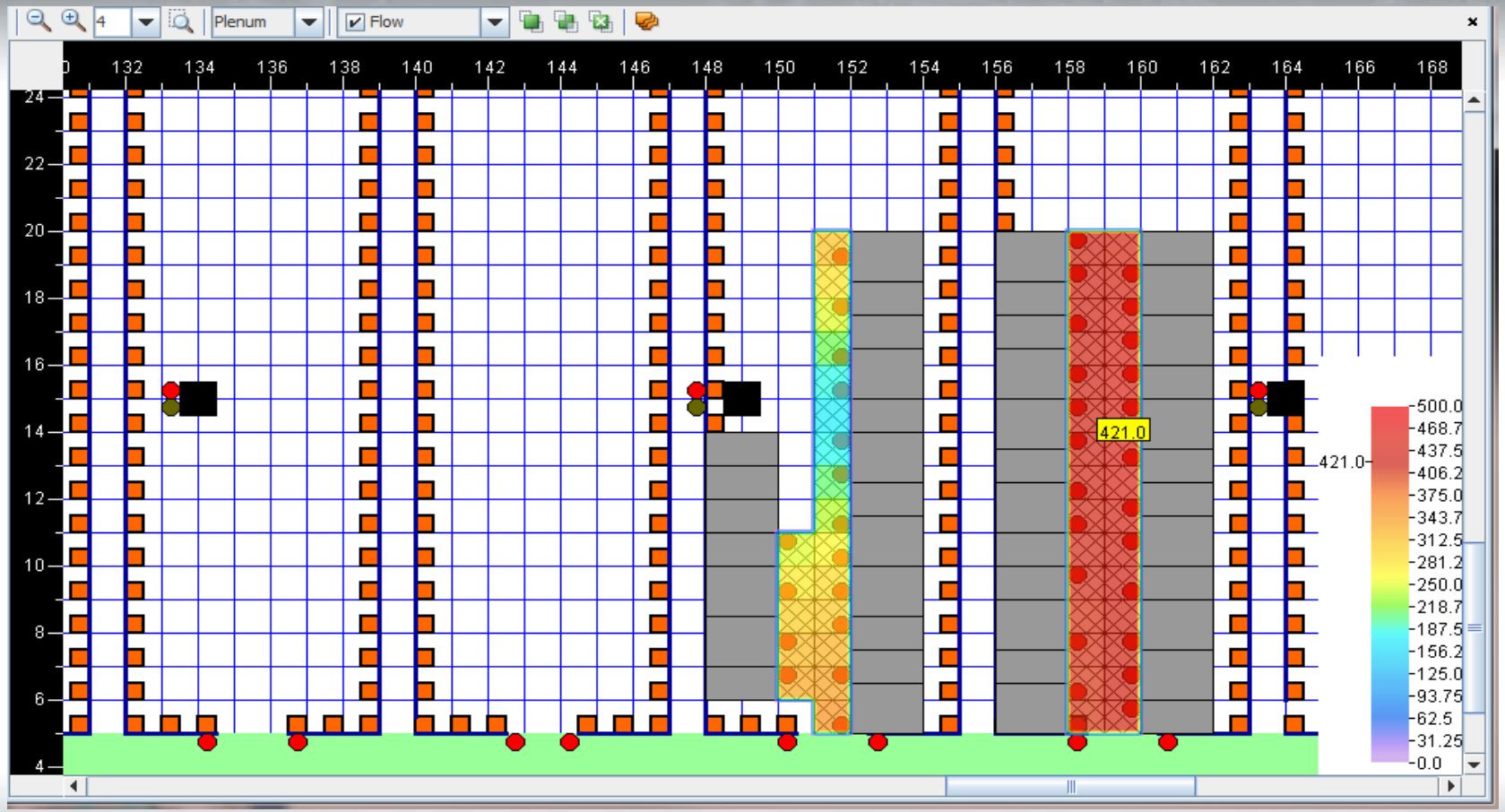
Power Distribution Analytics



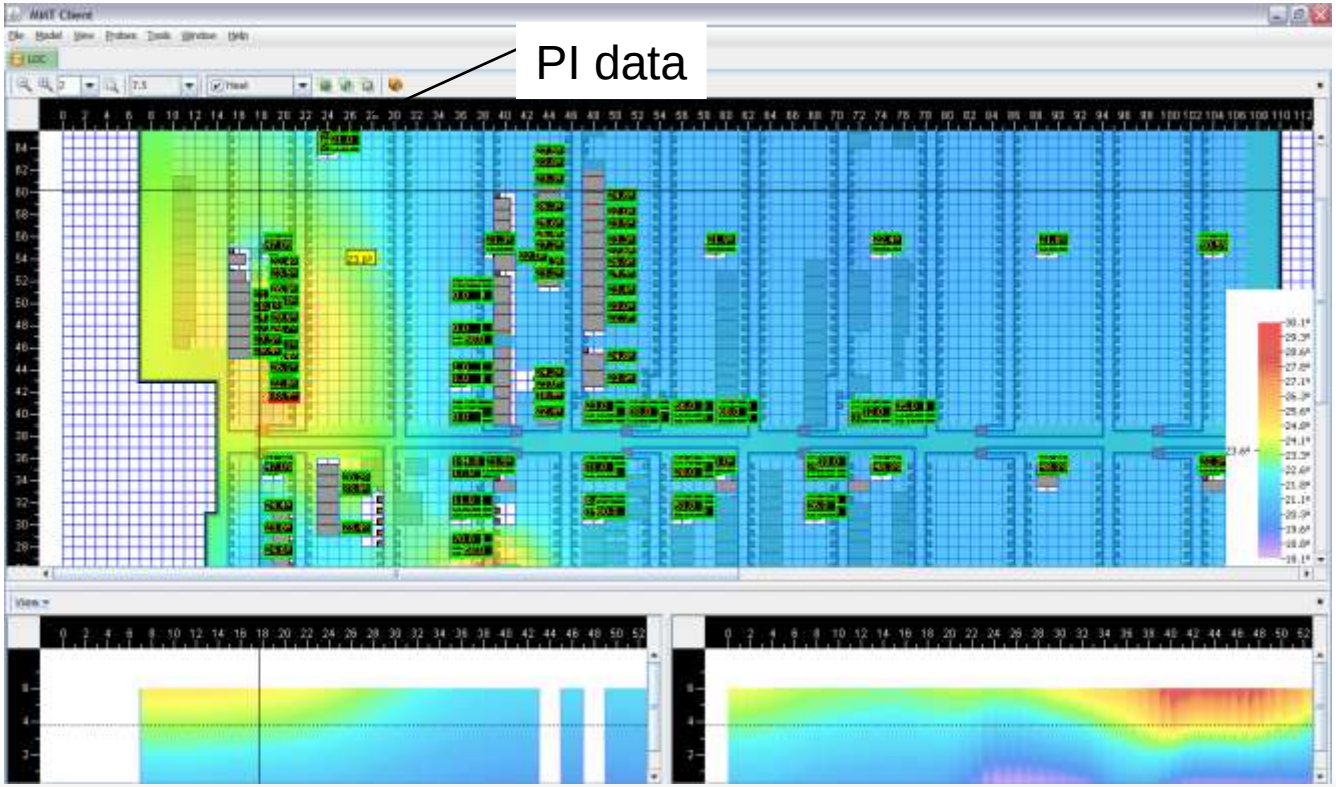
Cooling Analytics



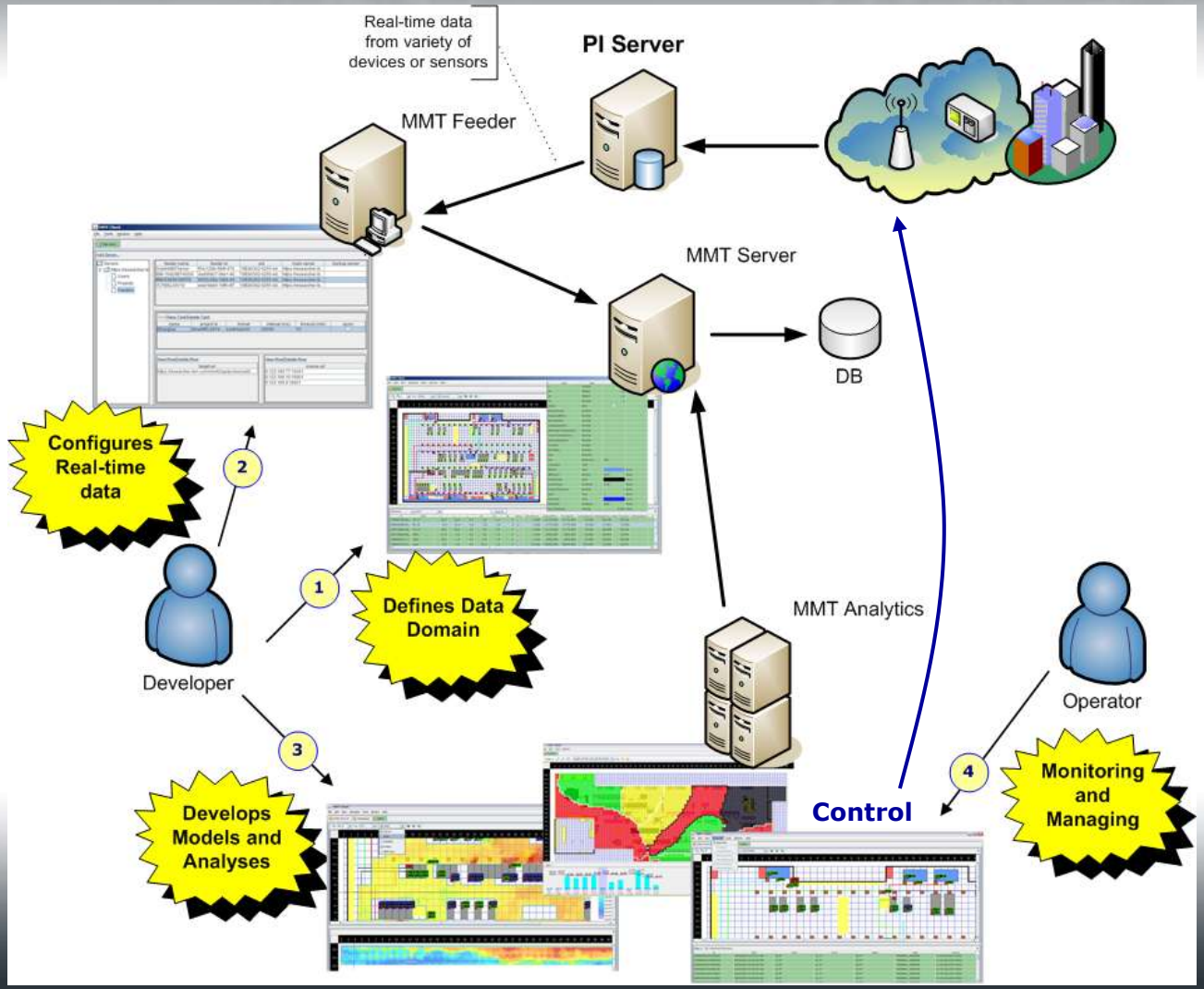
Flow Analytics



Heat Distribution Analytics



Integrated Modeling Environment



A tool/platform to define data models, read real-time data, plug-in analyses and visualization, deploy it to customers.

IBM – MMT - Conclusions

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- Carbon Impact (CI)
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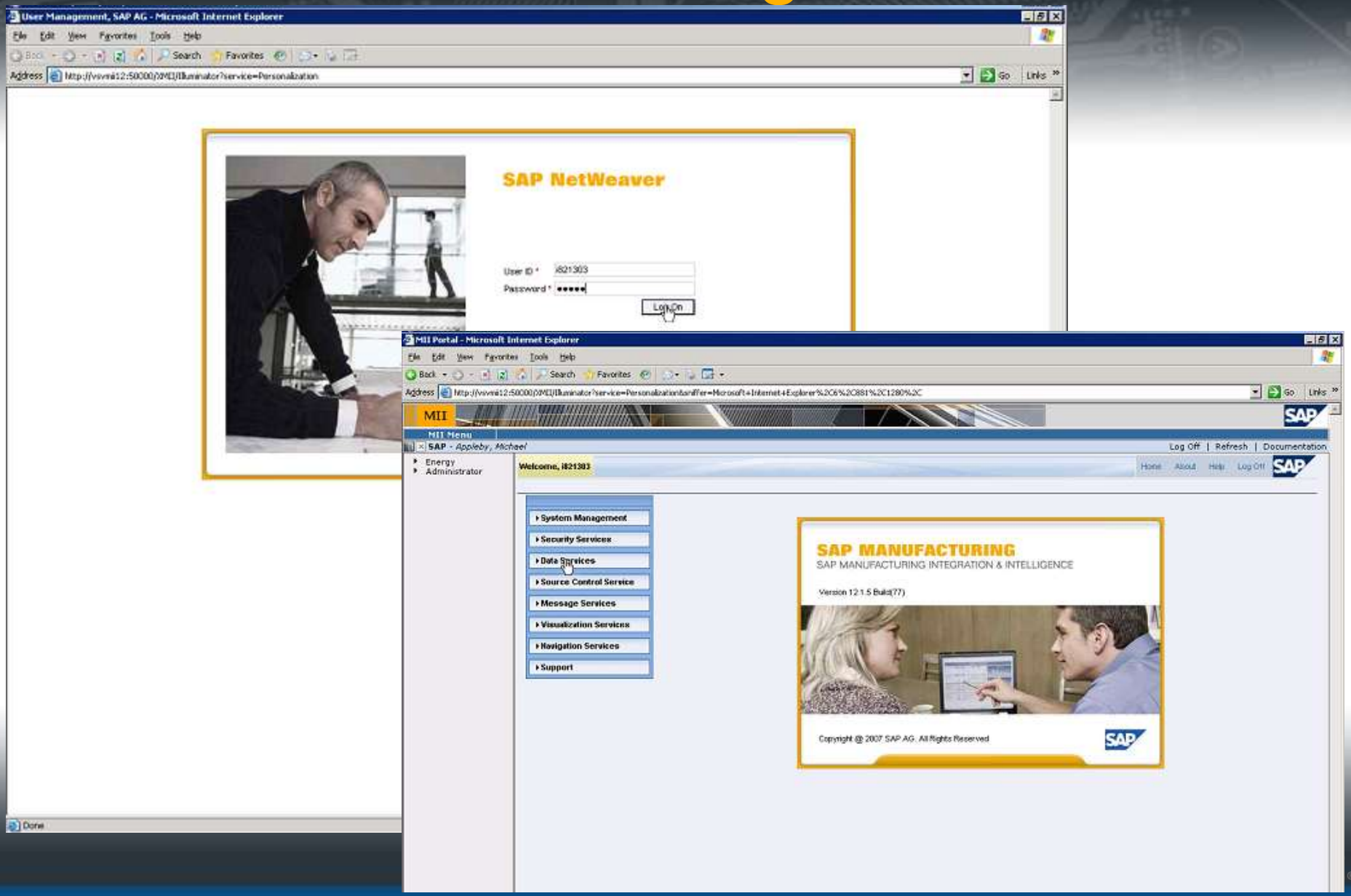
SAP – Xcelsius integration via MII



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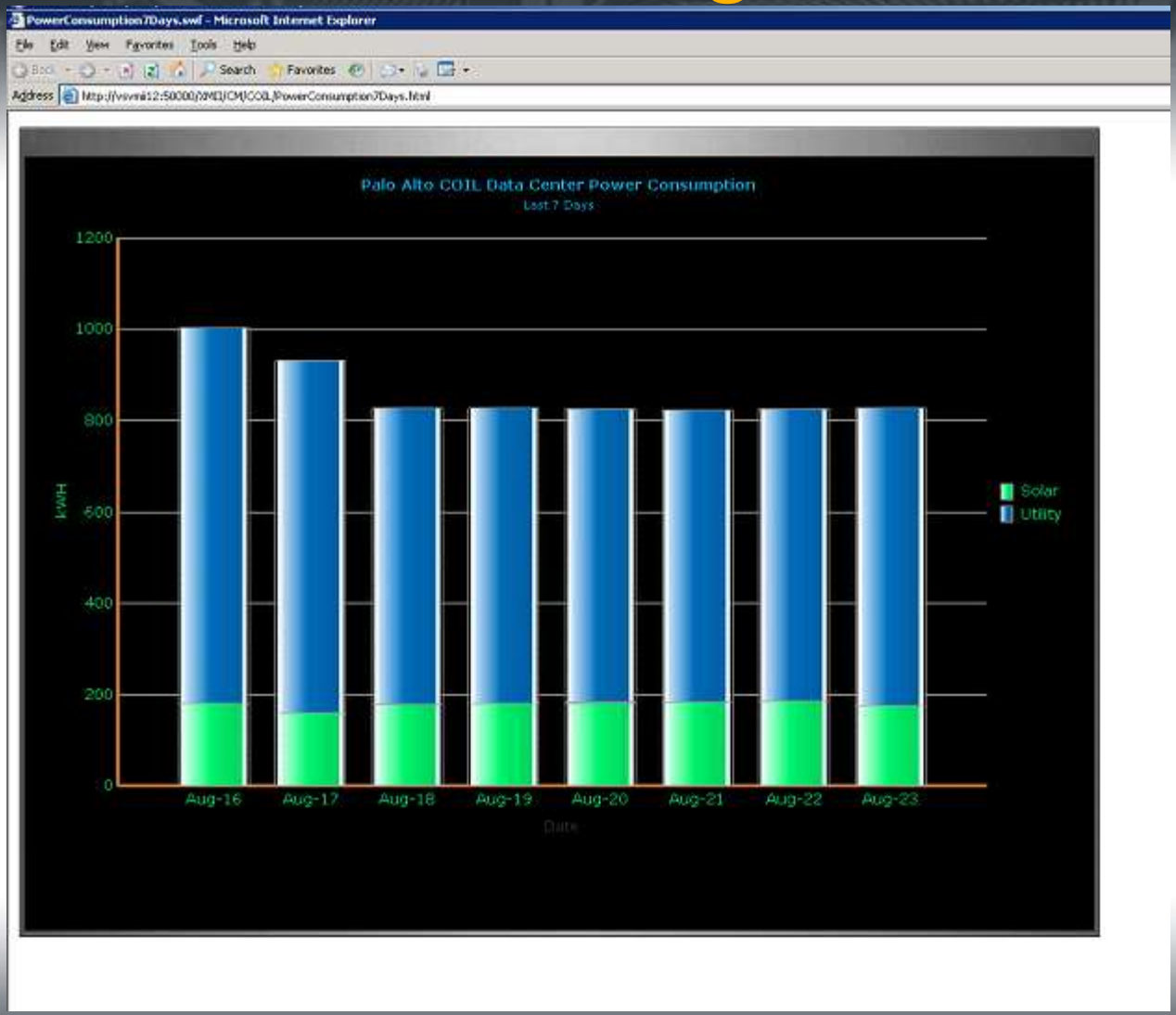

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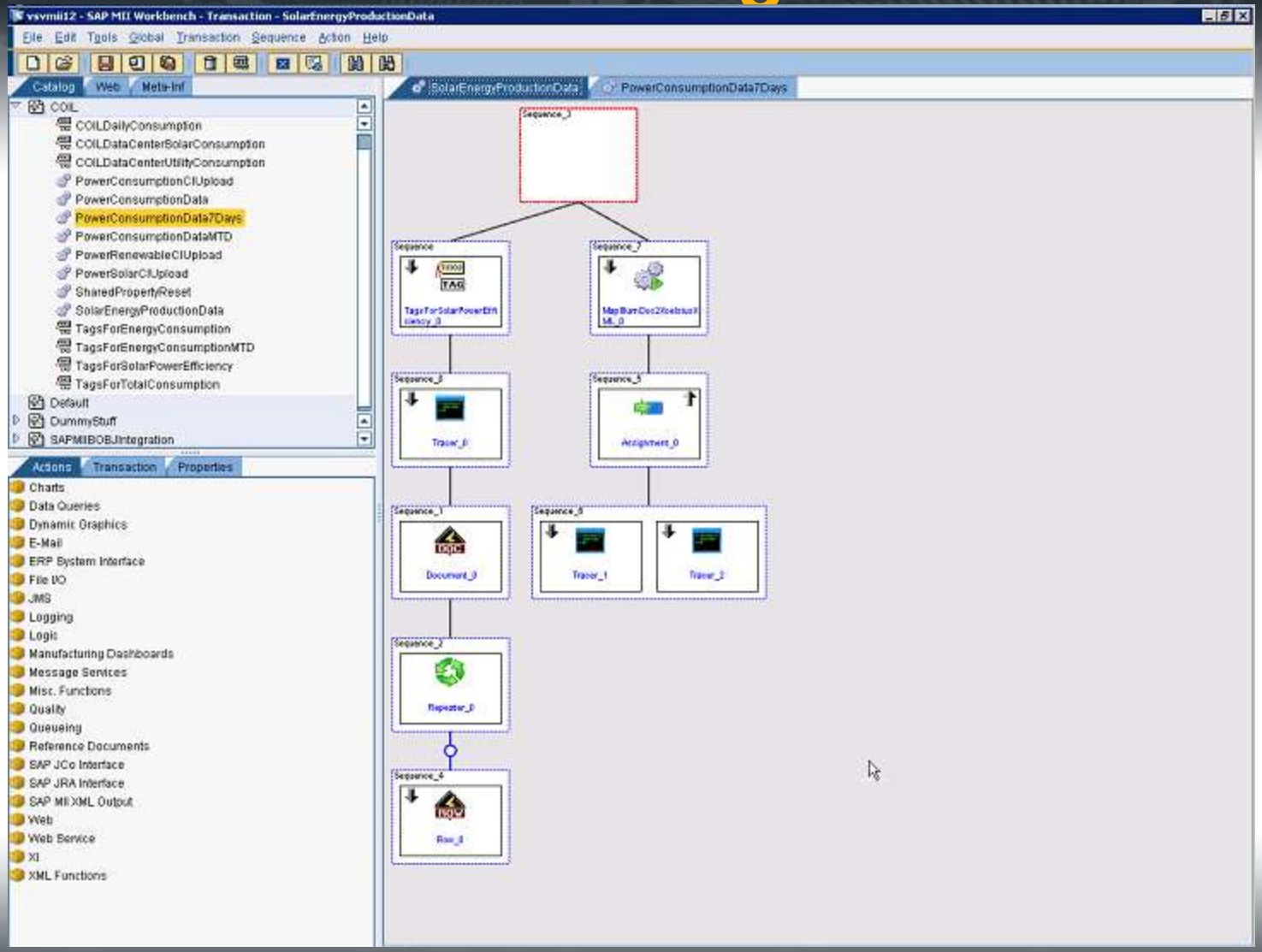

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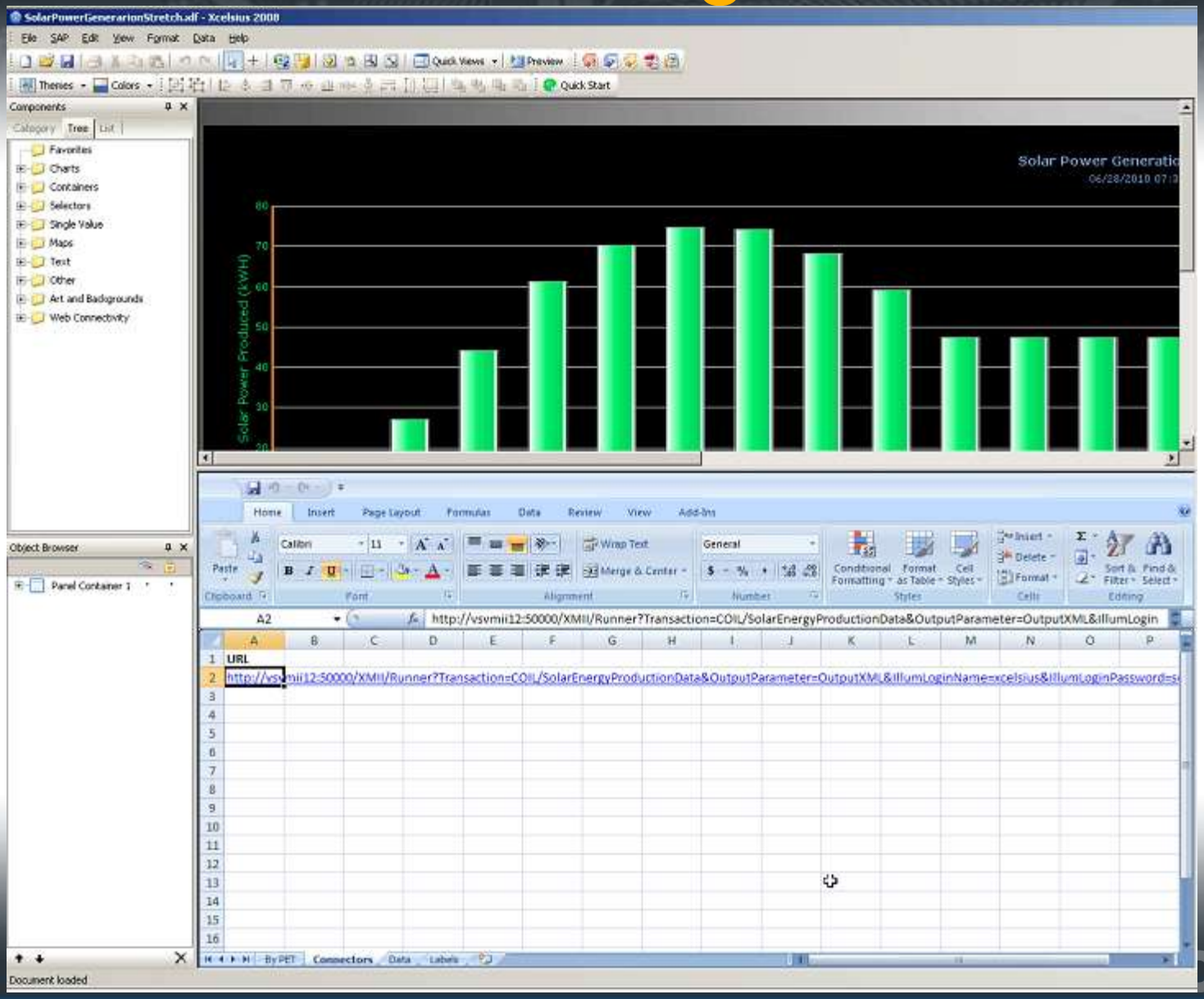

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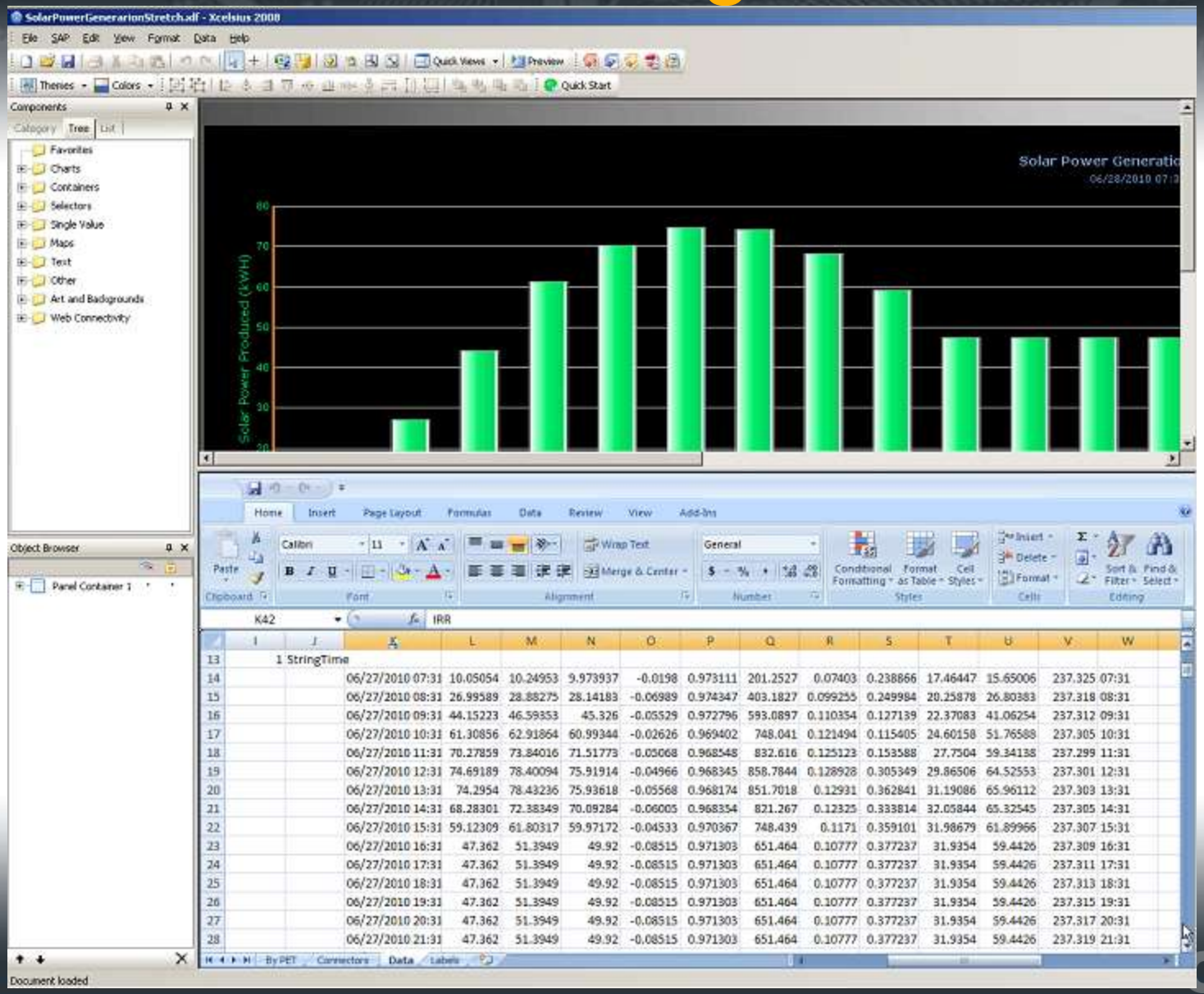

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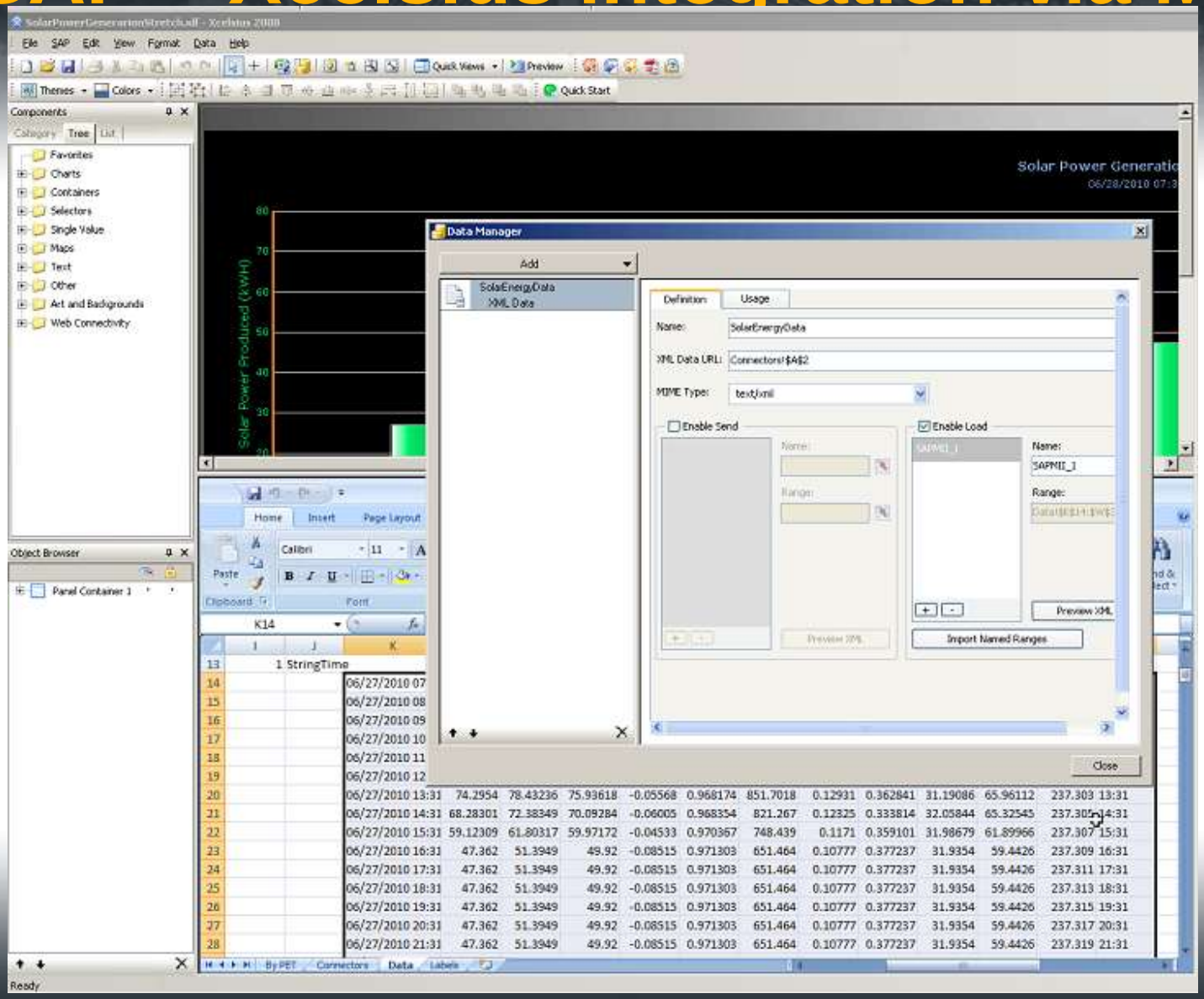

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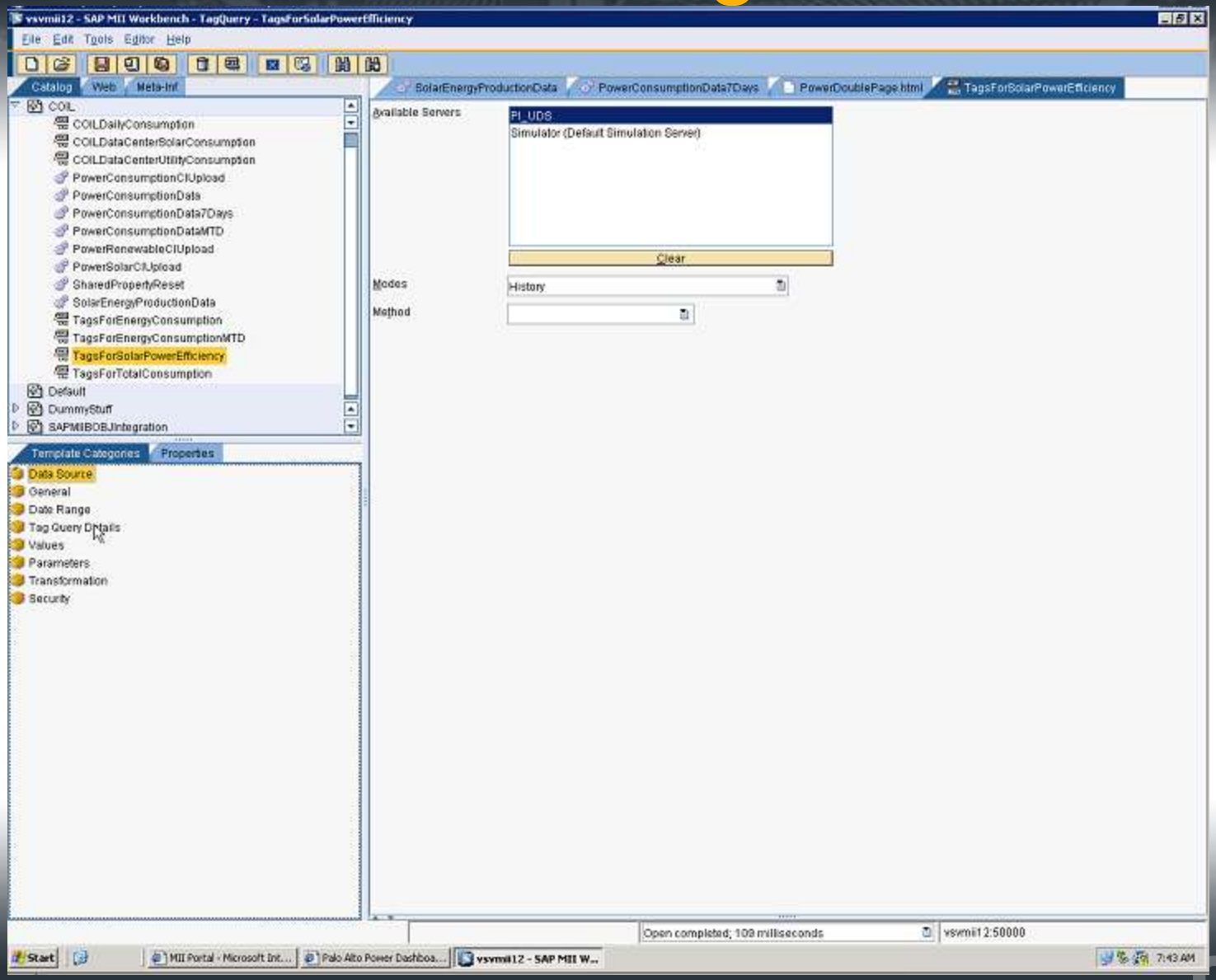

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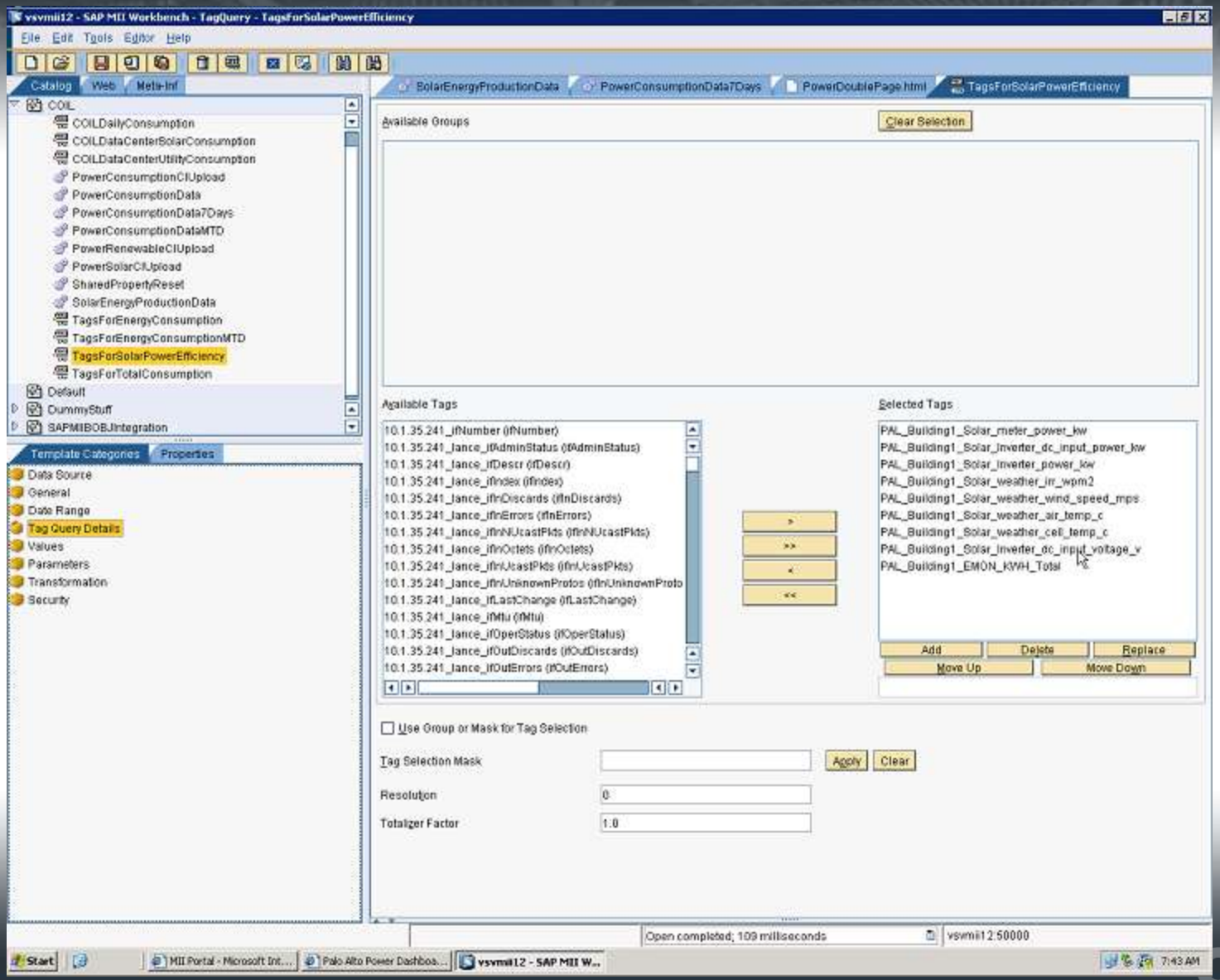

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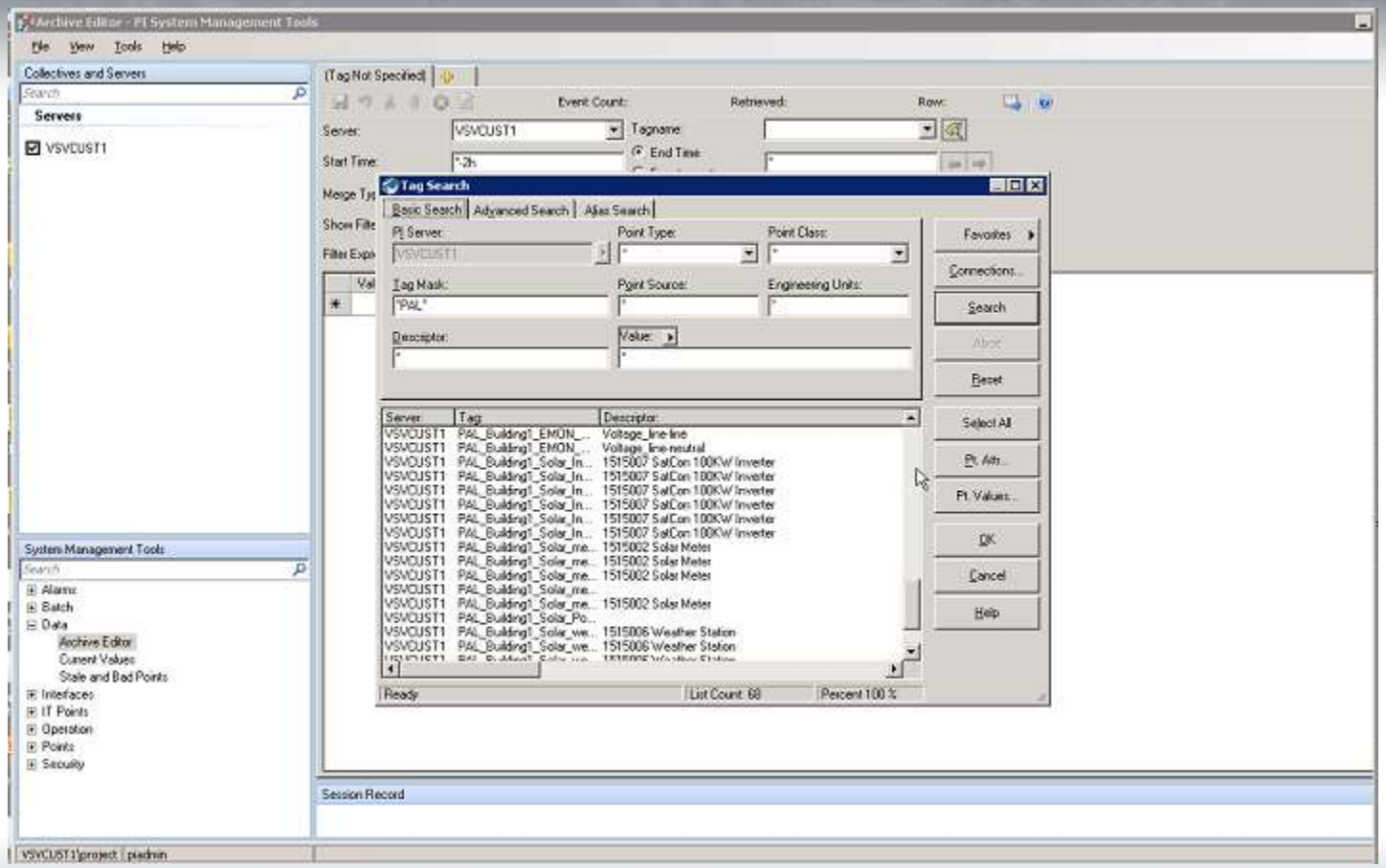

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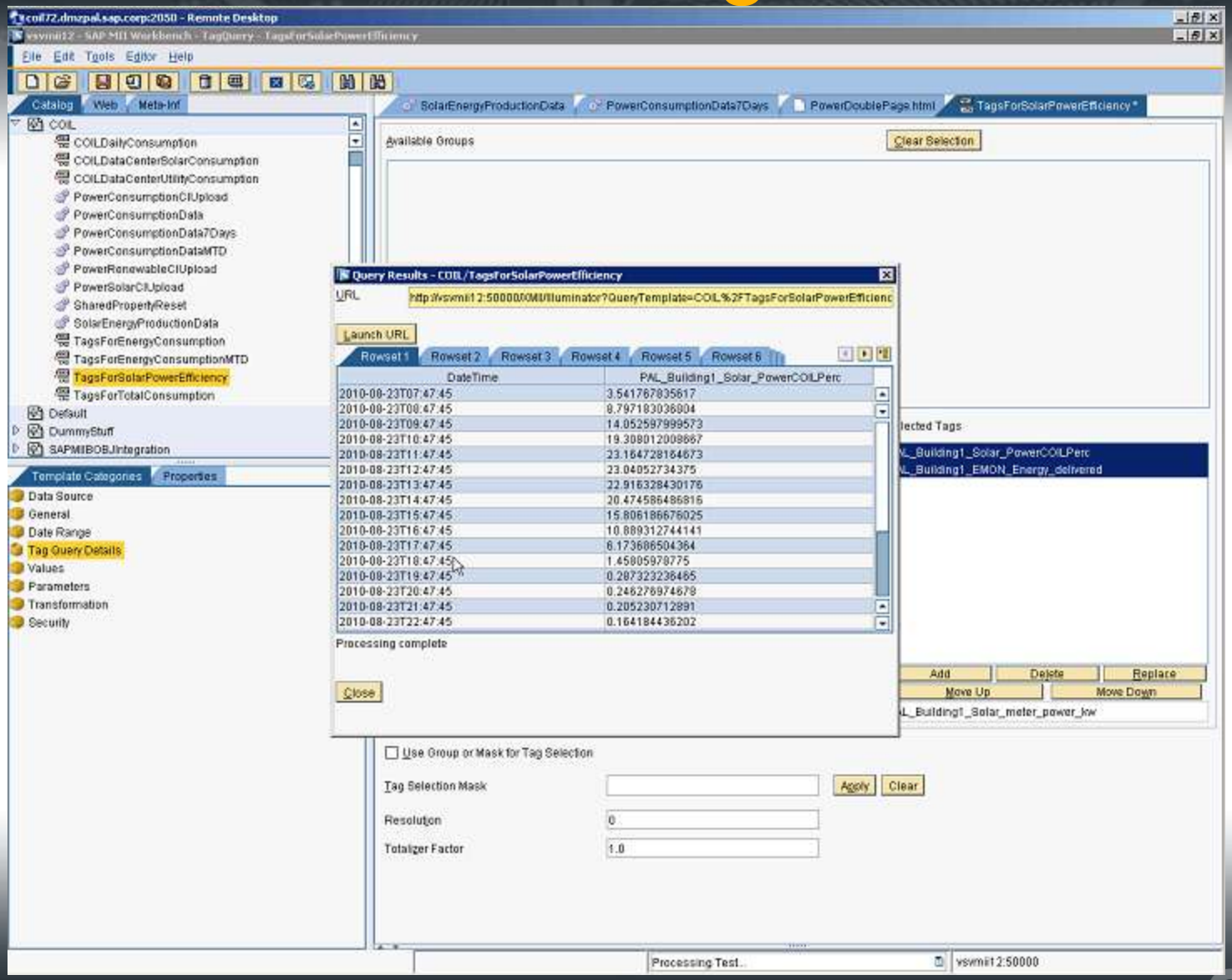

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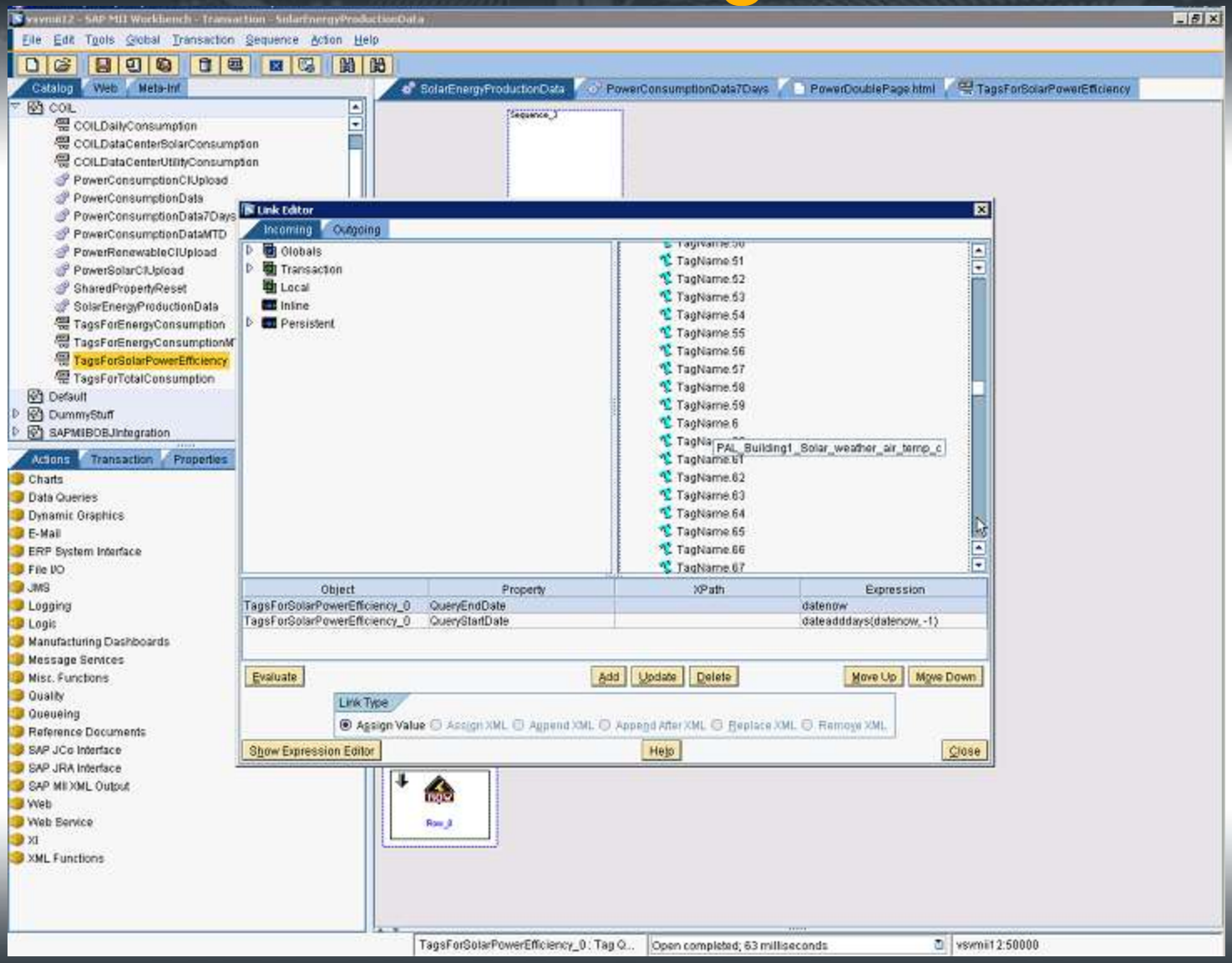

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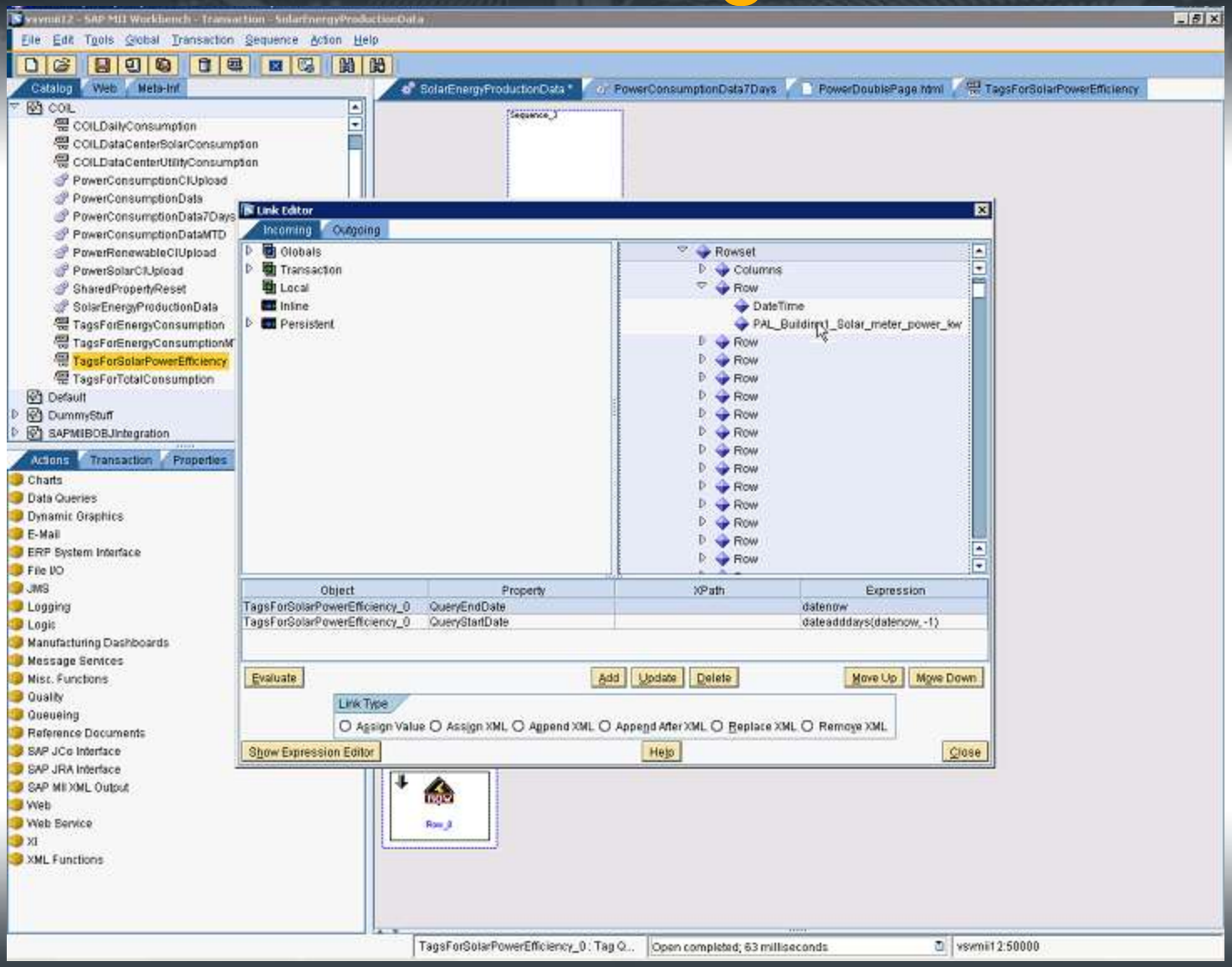

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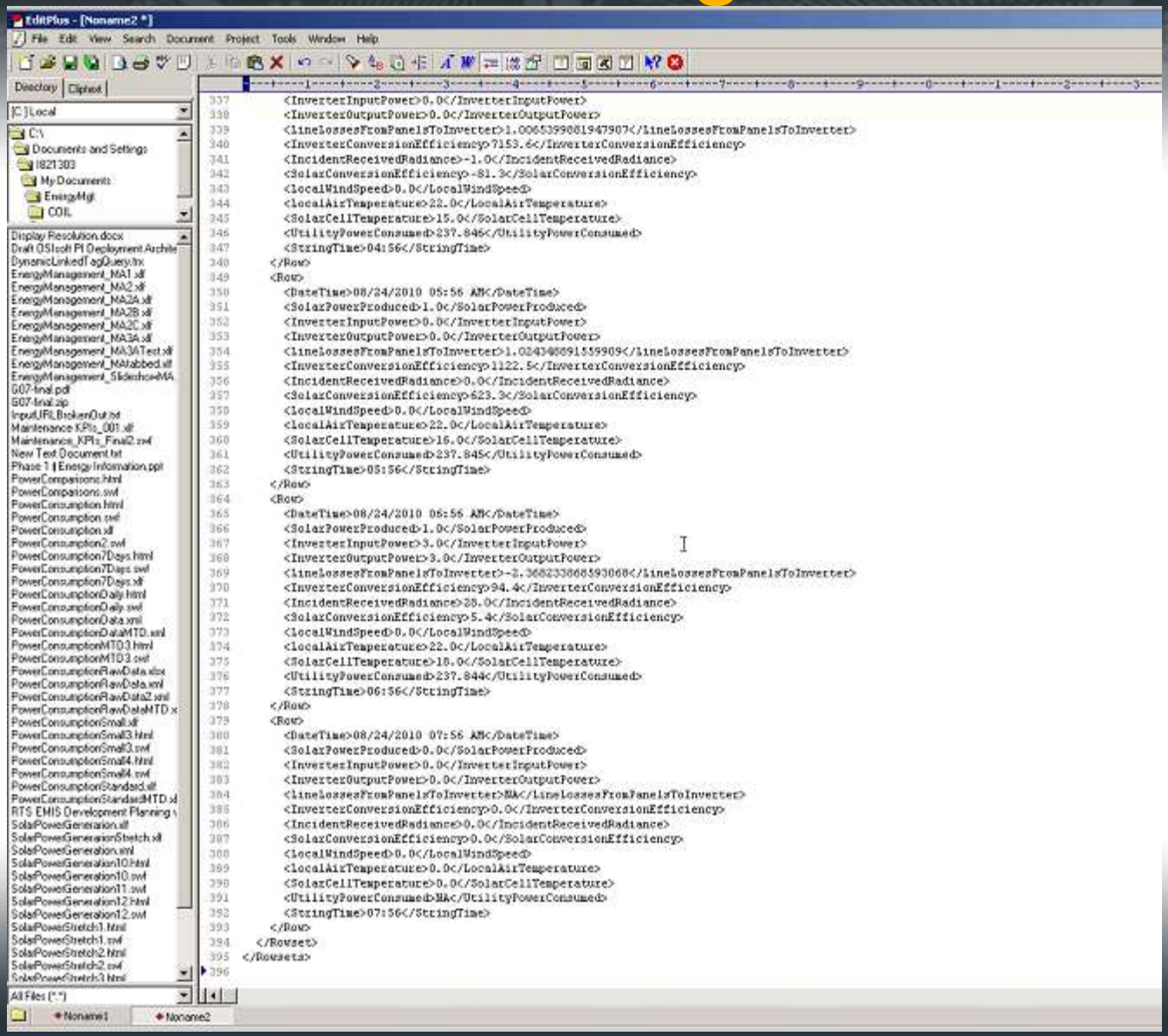

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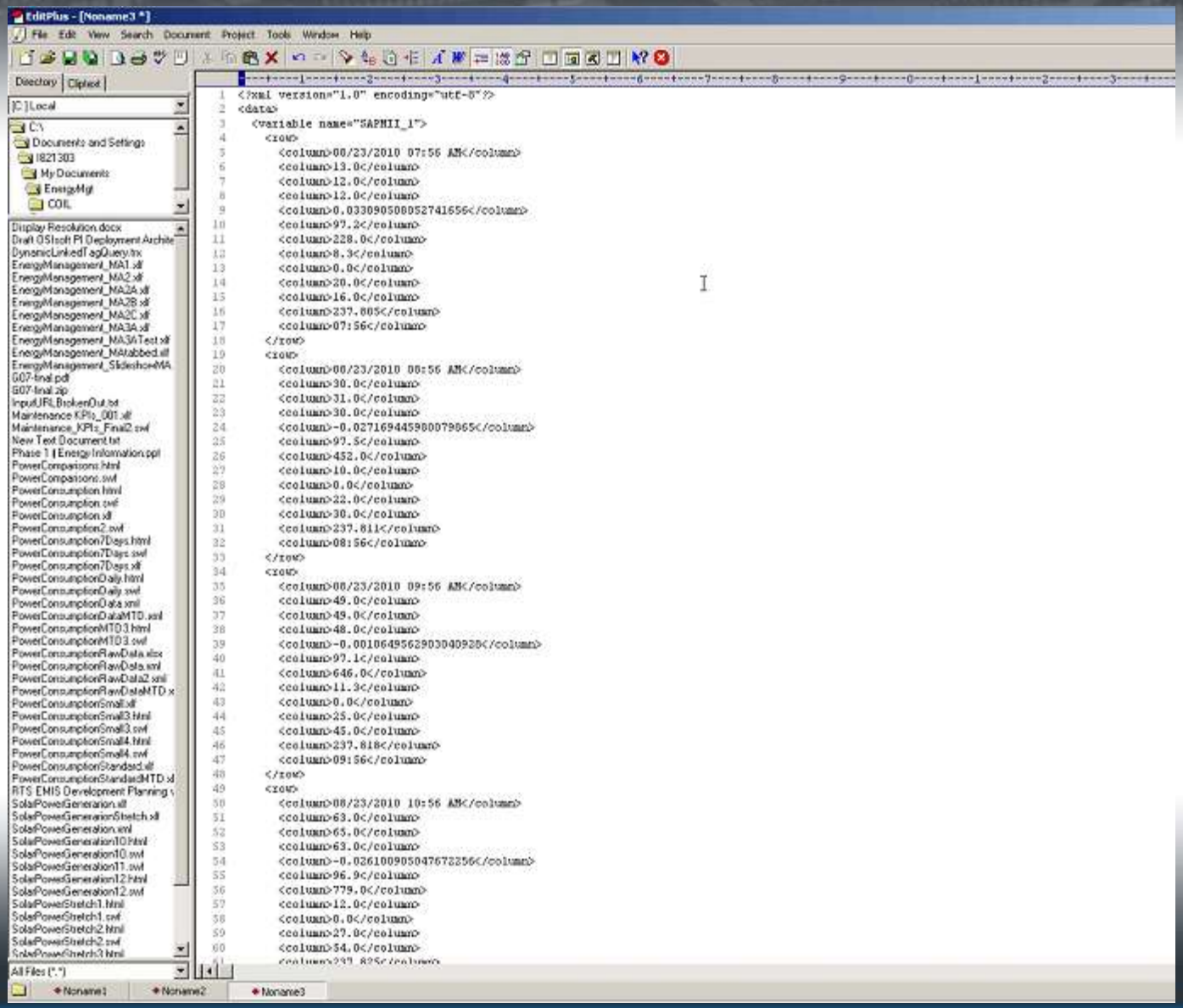
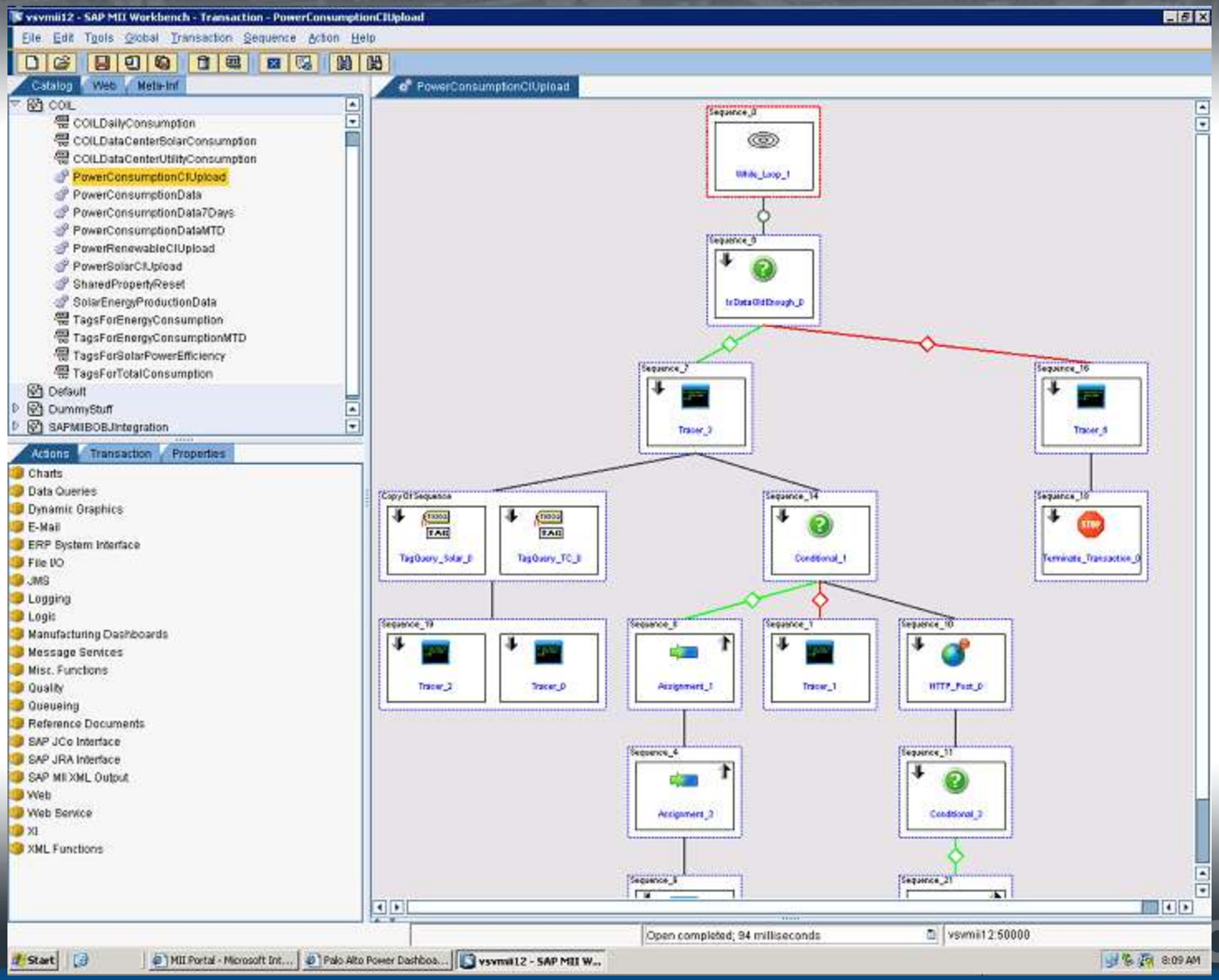


SAP – Carbon Impact integration via MII



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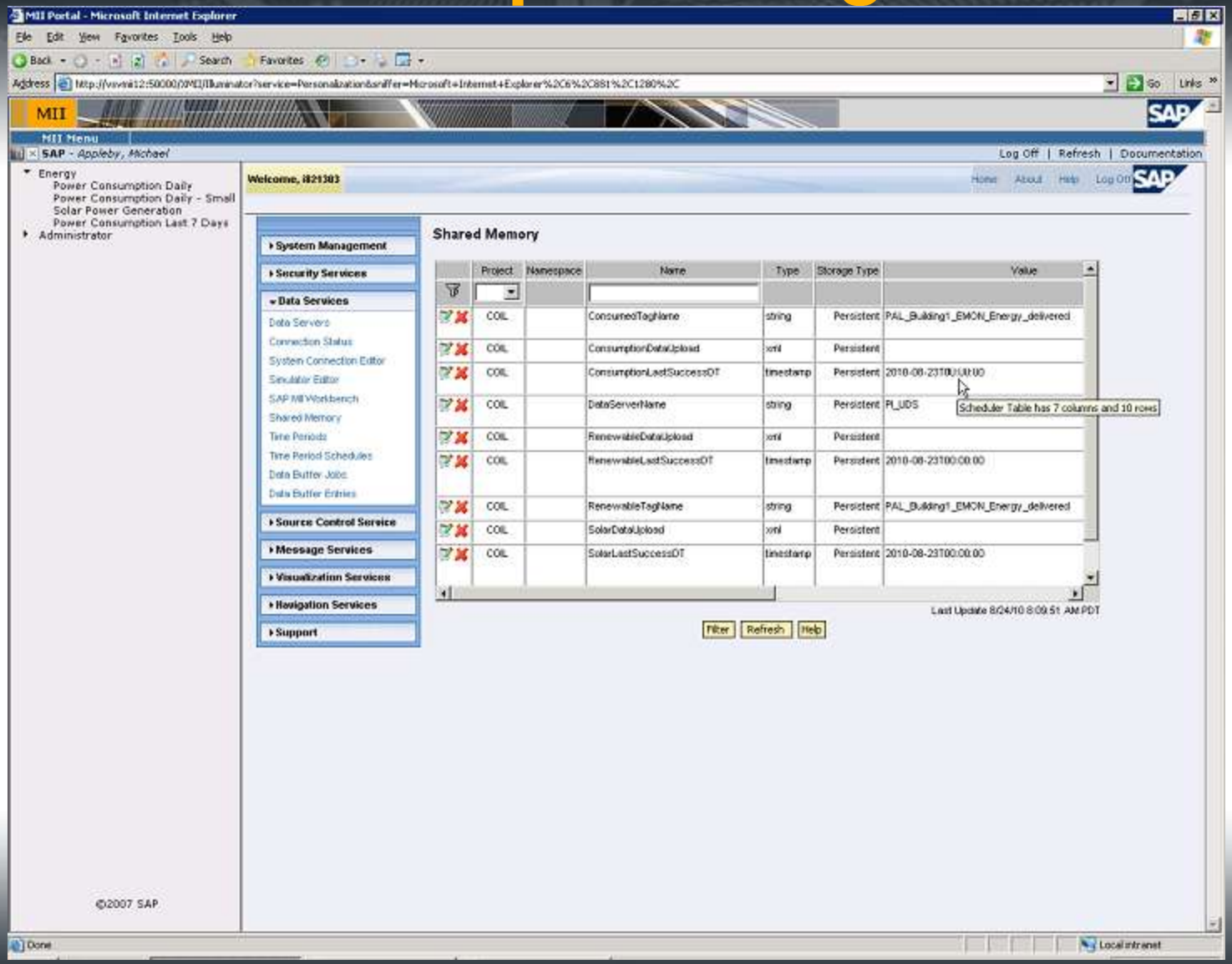

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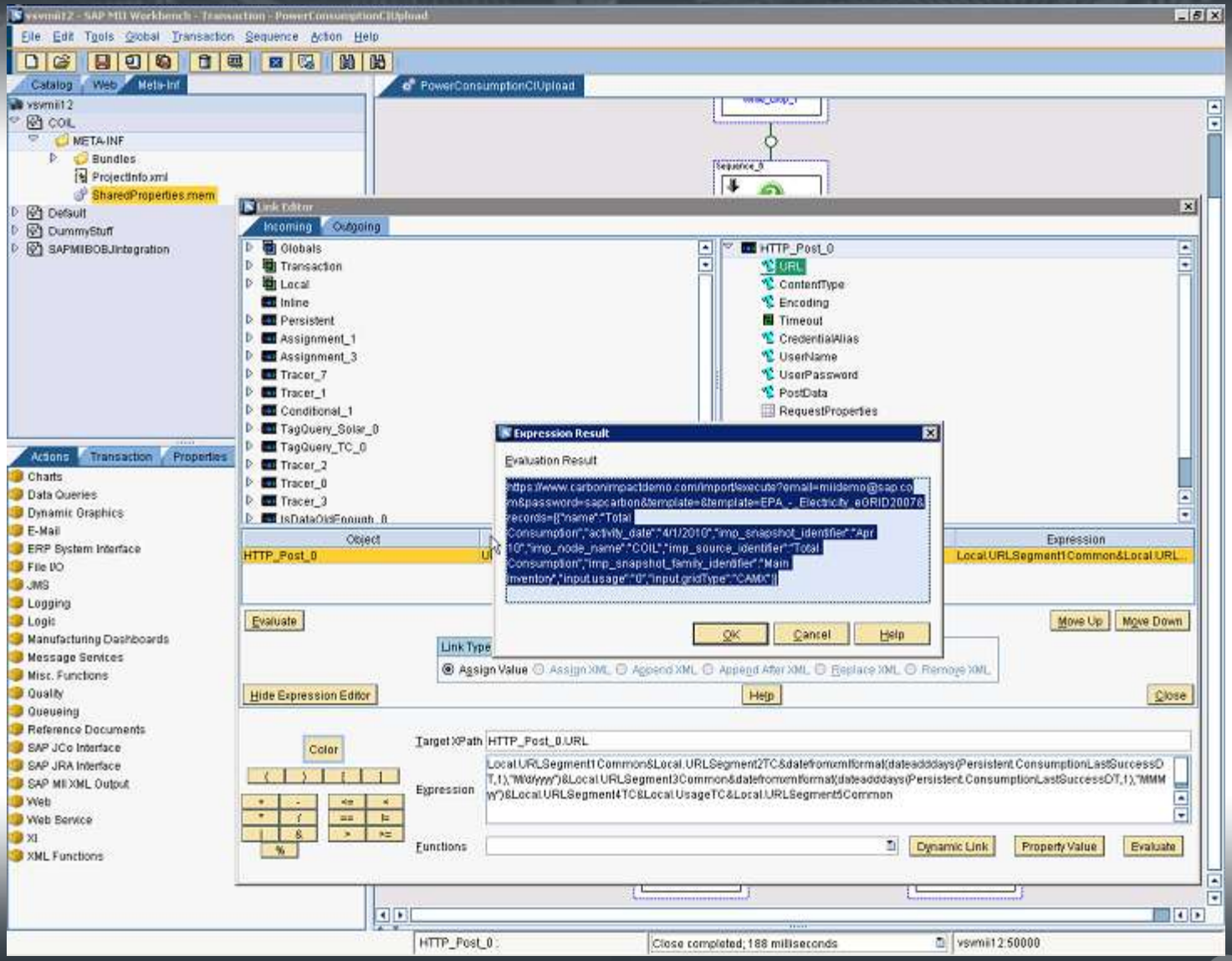

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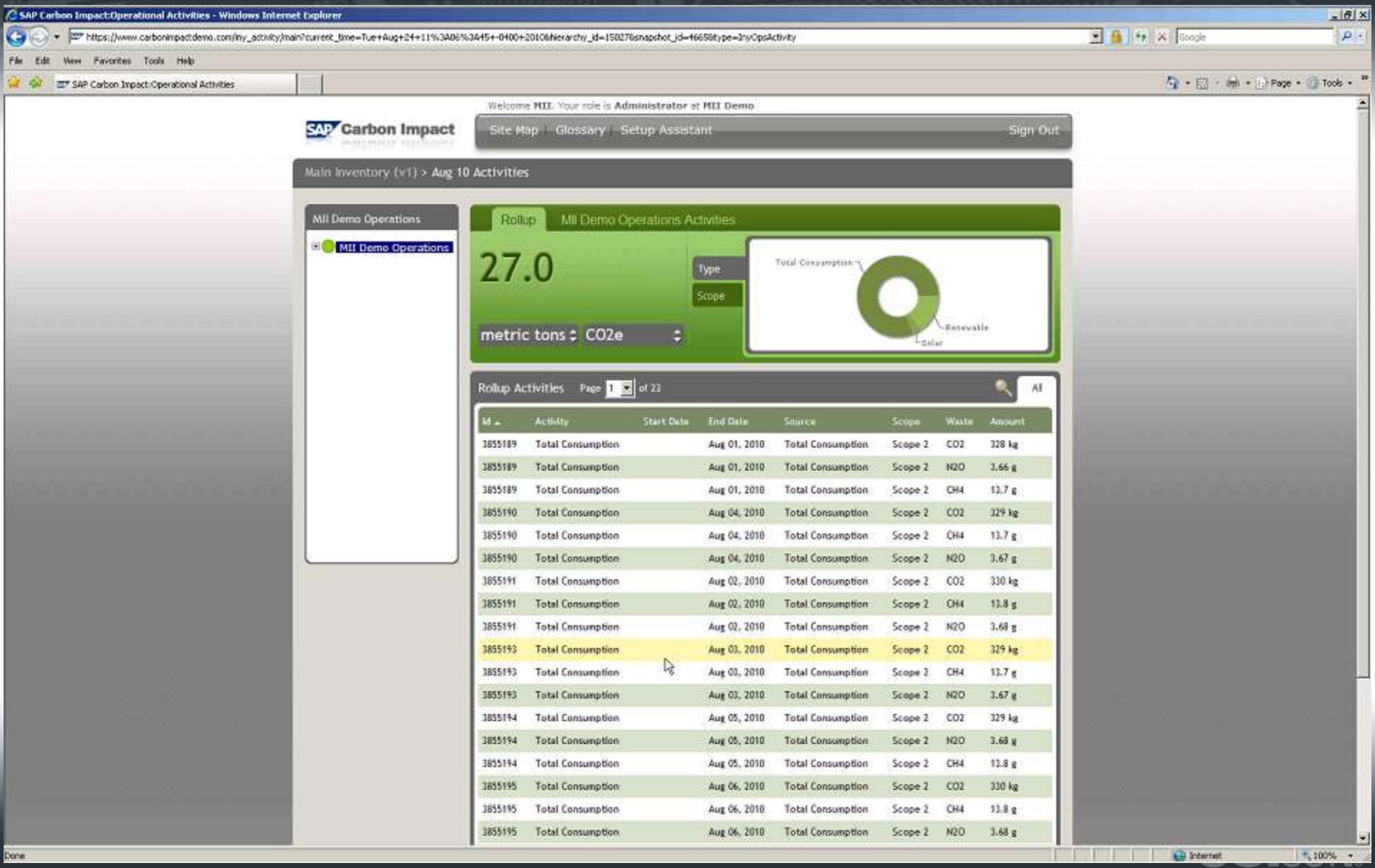
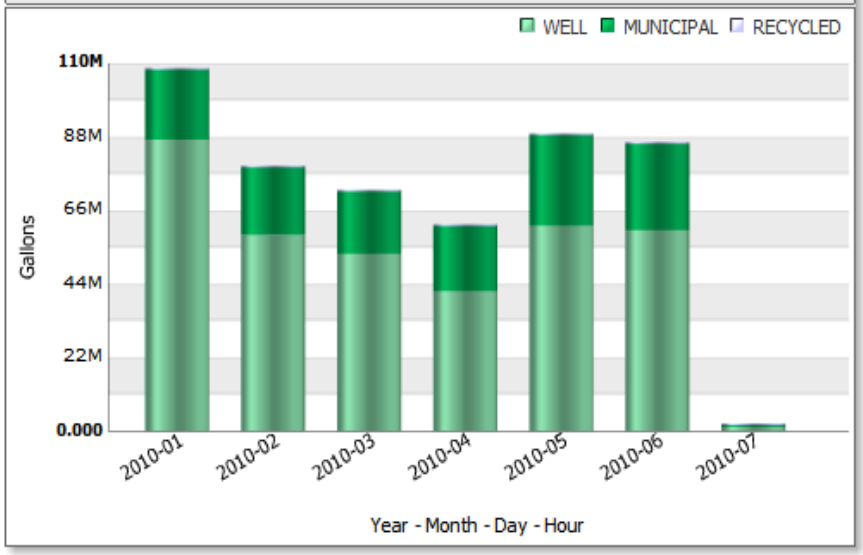


SAP – PM, PP/PI, QM

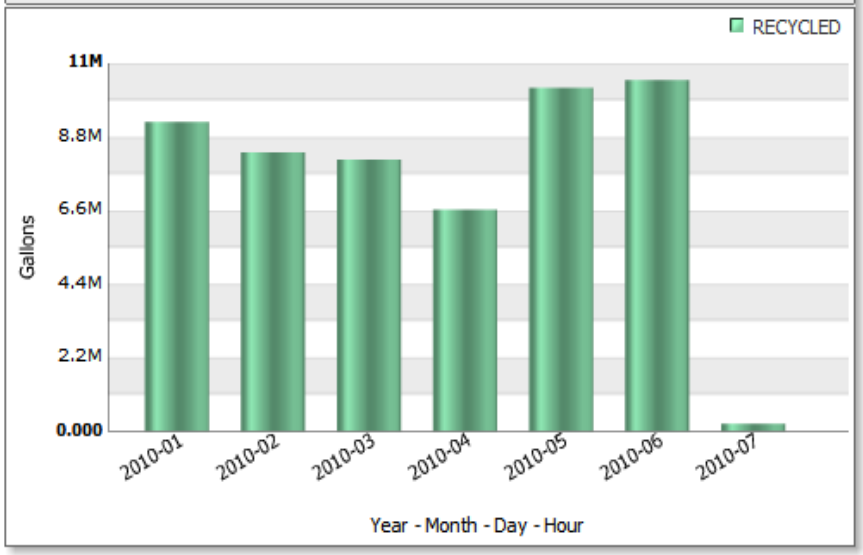
IBM Ireland – Green Sigma

PI JDBC → Tivoli Data Warehouse →Cognos BI

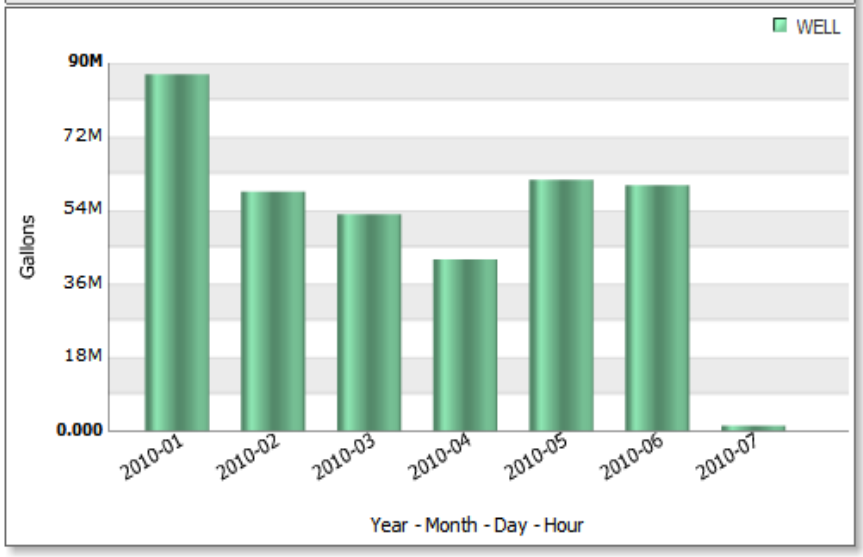
EFK : INCOMING WATER



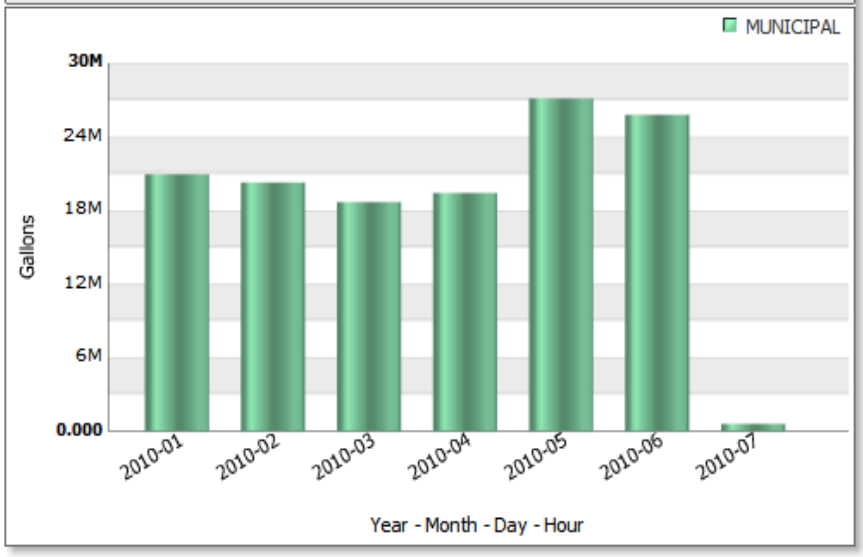
EFK : RECYCLED USAGE



EFK : WELL USAGE



EFK : MUNICIPAL USAGE



File Edit Source Refactor Navigate Search Project Data Run Window Help

Optim Solutions | Java

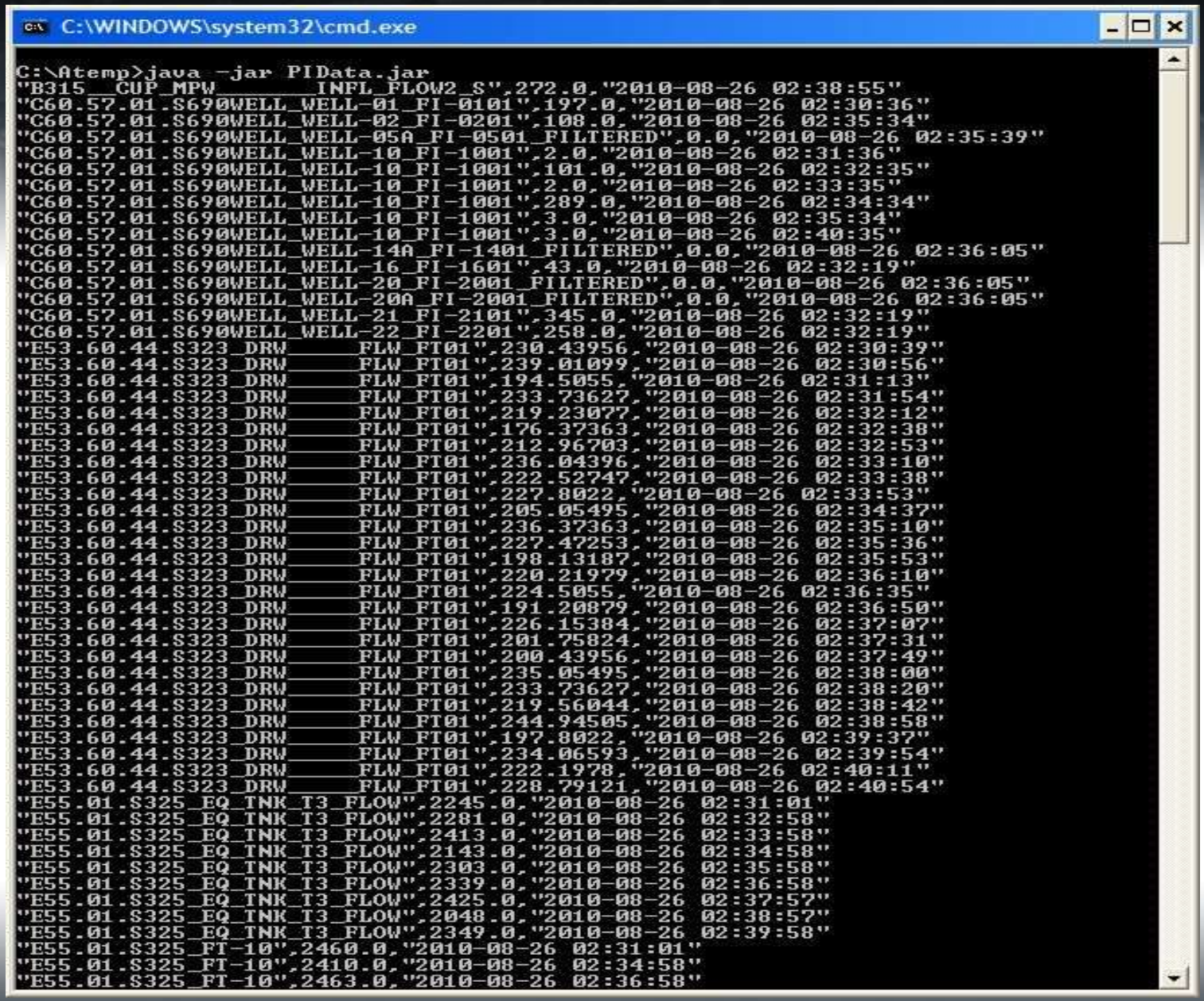
Main.java | DI_list.java | *PIGSDemo.java | PITest.java

```
int recordCount = 0;
String url = "jdbc:pisql://9.255.255.255:5461/Data Source=PIDataSRC;user=greensigma;password=greensigma ; Integrated Security=SSPI";
String driver = "com.osisoft.jdbc.Driver";
Statement stmt; ResultSet rs;
Properties plist = new Properties();

plist.put("LogConsole", "True");  // optionally switch on debug info
//plist.put("LogLevel", "3");  // 3=Fine
plist.put("user", "greensigma");
plist.put("password","greensigma");

try {
 Class.forName(driver).newInstance();
// System.out.println("About to Create Connection");
 con = DriverManager.getConnection(url, plist);
// System.out.println("Creating Statement");
 stmt = con.createStatement(ResultSet.TYPE_SCROLL_INSENSITIVE, ResultSet.CONCUR_READ_ONLY);

 rs = stmt.executeQuery("SELECT tag, value, time FROM picomp2 WHERE tag in " +
           "('E56.27.S317_INFTNK__FIT114','E53.60.44.S323_DRW____FLW_FT01','B315__CUP_MPW_____INFL_FLOW1_S'," +
           "'B315__CUP_MPW_____INFL_FLOW2_S','C60.57.01.S690WELL_WELL-01_FI-0101'," +
           "'C60.57.01.S690WELL_WELL-02_FI-0201'," +
           "'C60.57.01.S690WELL_WELL-04_FI-0401'," +
           "'C60.57.01.S690WELL_WELL-05_FI-0501_FILTERED'," +
           "'C60.57.01.S690WELL_WELL-05A_FI-0501_FILTERED'," +
           "'C60.57.01.S690WELL_WELL-06_FI-0601'," +
           "'C60.57.01.S690WELL_WELL-07_FI-0701'," +
           "'C60.57.01.S690WELL_WELL-23_FI-2301'," +
           "'C60.57.01.S690WELL_WELL-25_FI-2501'," +
           "'C60.57.01.S690WELL_WELL-14_FI-1401'," +
           "'C60.57.01.S690WELL_WELL-14A_FI-1401_FILTERED'," +
           "'C60.57.01.S690WELL_WELL-16_FI-1601'," +
           "'C60.57.01.S690WELL_WELL-890_FI-8901'," +
           "'C60.57.01.S690WELL_WELL-20_FI-2001_FILTERED'," +
           "'C60.57.01.S690WELL_WELL-20A_FI-2001_FILTERED'," +
           "'C60.57.01.S690WELL_WELL-21_FI-2101'," +
           "'C60.57.01.S690WELL_WELL-22_FI-2201'," +
           "'C60.57.01.S690WELL_WELL-10_FI-1001'," +
           "'C60.57.01.S690WELL_WELL-12_FI-1201'," +
           "'S317MP17:S317_EFFTNK__FIT127'," +
           "'S317MP17:S317_EFFTNK__FIT127A'," +
           "'E55.01.S325_EQ_TNK_T3_FLOW'," +
           "'E55.01.S325_EQ_TNK_T4_FLOW'," +
           "'E55.01.S325_FT-9'," +
           "'E55.01.S325_FT-10')" +
           " and time > '2010-08-26 00:00:00' and time < '2010-08-26 01:00:00'");
System.out.println("      Start of Output      ");
```


C:\WINDOWS\system32\cmd.exe
C:\Atemp>java -jar PIData.jar
"B315__CUP_MPW_____INFL_FLOW2_S",272.0,"2010-08-26 02:38:55"
"C60.57.01.S690WELL_WELL-01_FI-0101",197.0,"2010-08-26 02:30:36"
"C60.57.01.S690WELL_WELL-02_FI-0201",108.0,"2010-08-26 02:35:34"
"C60.57.01.S690WELL_WELL-05A_FI-0501_FILTERED",0.0,"2010-08-26 02:35:39"
"C60.57.01.S690WELL_WELL-10_FI-1001",2.0,"2010-08-26 02:31:36"
"C60.57.01.S690WELL_WELL-10_FI-1001",101.0,"2010-08-26 02:32:35"
"C60.57.01.S690WELL_WELL-10_FI-1001",2.0,"2010-08-26 02:33:35"
"C60.57.01.S690WELL_WELL-10_FI-1001",289.0,"2010-08-26 02:34:34"
"C60.57.01.S690WELL_WELL-10_FI-1001",3.0,"2010-08-26 02:35:34"
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"C60.57.01.S690WELL_WELL-22_FI-2201",258.0,"2010-08-26 02:32:19"
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"E53.60.44.S323_DRW_____FLW_FT01",239.01099,"2010-08-26 02:30:56"
"E53.60.44.S323_DRW_____FLW_FT01",194.5055,"2010-08-26 02:31:13"
"E53.60.44.S323_DRW_____FLW_FT01",233.73627,"2010-08-26 02:31:54"
"E53.60.44.S323_DRW_____FLW_FT01",219.23077,"2010-08-26 02:32:12"
"E53.60.44.S323_DRW_____FLW_FT01",176.37363,"2010-08-26 02:32:38"
"E53.60.44.S323_DRW_____FLW_FT01",212.96703,"2010-08-26 02:32:53"
"E53.60.44.S323_DRW_____FLW_FT01",236.04396,"2010-08-26 02:33:10"
"E53.60.44.S323_DRW_____FLW_FT01",222.52747,"2010-08-26 02:33:38"
"E53.60.44.S323_DRW_____FLW_FT01",227.8022,"2010-08-26 02:33:53"
"E53.60.44.S323_DRW_____FLW_FT01",205.05495,"2010-08-26 02:34:37"
"E53.60.44.S323_DRW_____FLW_FT01",236.37363,"2010-08-26 02:35:10"
"E53.60.44.S323_DRW_____FLW_FT01",227.47253,"2010-08-26 02:35:36"
"E53.60.44.S323_DRW_____FLW_FT01",198.13187,"2010-08-26 02:35:53"
"E53.60.44.S323_DRW_____FLW_FT01",220.21979,"2010-08-26 02:36:10"
"E53.60.44.S323_DRW_____FLW_FT01",224.5055,"2010-08-26 02:36:35"
"E53.60.44.S323_DRW_____FLW_FT01",191.20879,"2010-08-26 02:36:50"
"E53.60.44.S323_DRW_____FLW_FT01",226.15384,"2010-08-26 02:37:07"
"E53.60.44.S323_DRW_____FLW_FT01",201.75824,"2010-08-26 02:37:31"
"E53.60.44.S323_DRW_____FLW_FT01",200.43956,"2010-08-26 02:37:49"
"E53.60.44.S323_DRW_____FLW_FT01",235.05495,"2010-08-26 02:38:00"
"E53.60.44.S323_DRW_____FLW_FT01",233.73627,"2010-08-26 02:38:20"
"E53.60.44.S323_DRW_____FLW_FT01",219.56044,"2010-08-26 02:38:42"
"E53.60.44.S323_DRW_____FLW_FT01",244.94505,"2010-08-26 02:38:58"
"E53.60.44.S323_DRW_____FLW_FT01",197.8022,"2010-08-26 02:39:37"
"E53.60.44.S323_DRW_____FLW_FT01",234.06593,"2010-08-26 02:39:54"
"E53.60.44.S323_DRW_____FLW_FT01",222.1978,"2010-08-26 02:40:11"
"E53.60.44.S323_DRW_____FLW_FT01",228.79121,"2010-08-26 02:40:54"
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"E55.01.S325_EQ_TNK_T3_FLOW",2281.0,"2010-08-26 02:32:58"
"E55.01.S325_EQ_TNK_T3_FLOW",2413.0,"2010-08-26 02:33:58"
"E55.01.S325_EQ_TNK_T3_FLOW",2143.0,"2010-08-26 02:34:58"
"E55.01.S325_EQ_TNK_T3_FLOW",2303.0,"2010-08-26 02:35:58"
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"E55.01.S325_EQ_TNK_T3_FLOW",2048.0,"2010-08-26 02:38:57"
"E55.01.S325_EQ_TNK_T3_FLOW",2349.0,"2010-08-26 02:39:58"
"E55.01.S325_FT-10",2460.0,"2010-08-26 02:31:01"
"E55.01.S325_FT-10",2410.0,"2010-08-26 02:34:58"
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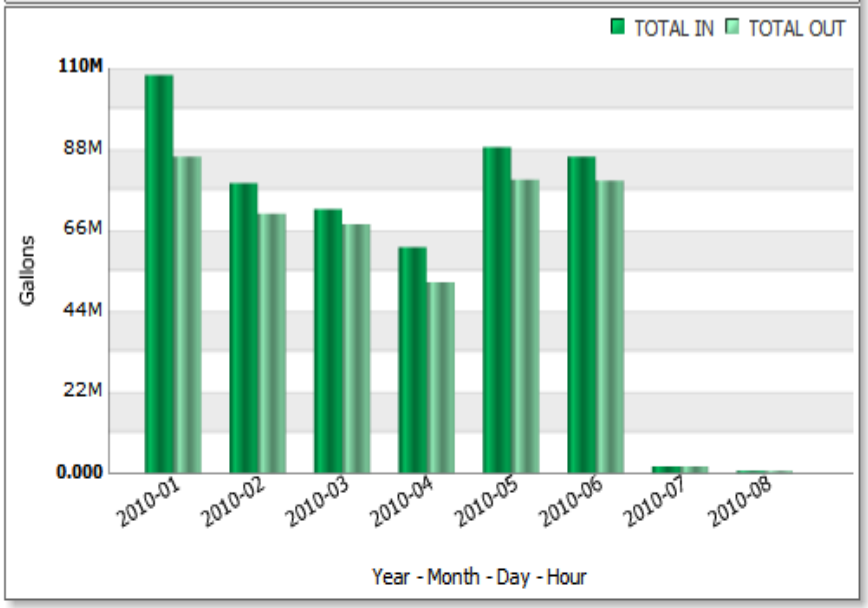
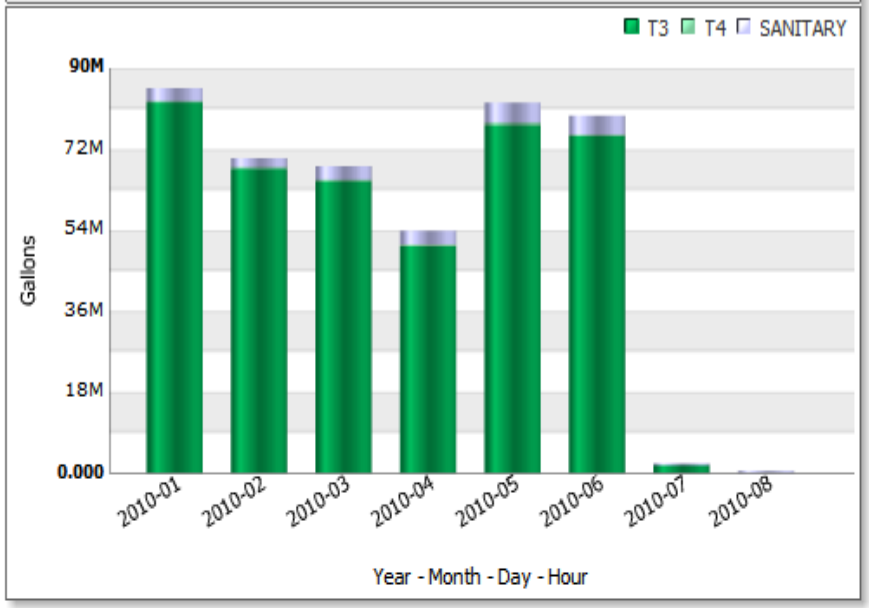
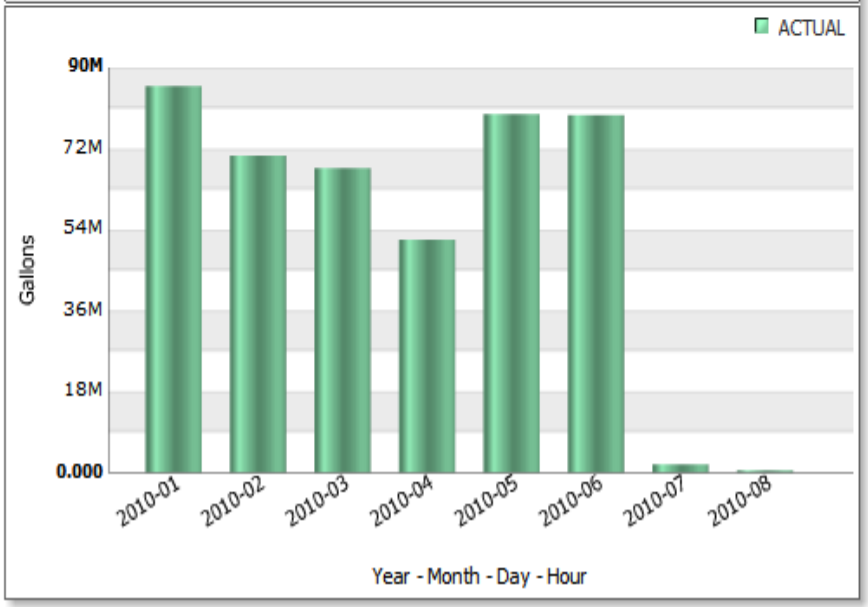
EFK : DISHCARGE TOTAL IN / TOTAL OUT



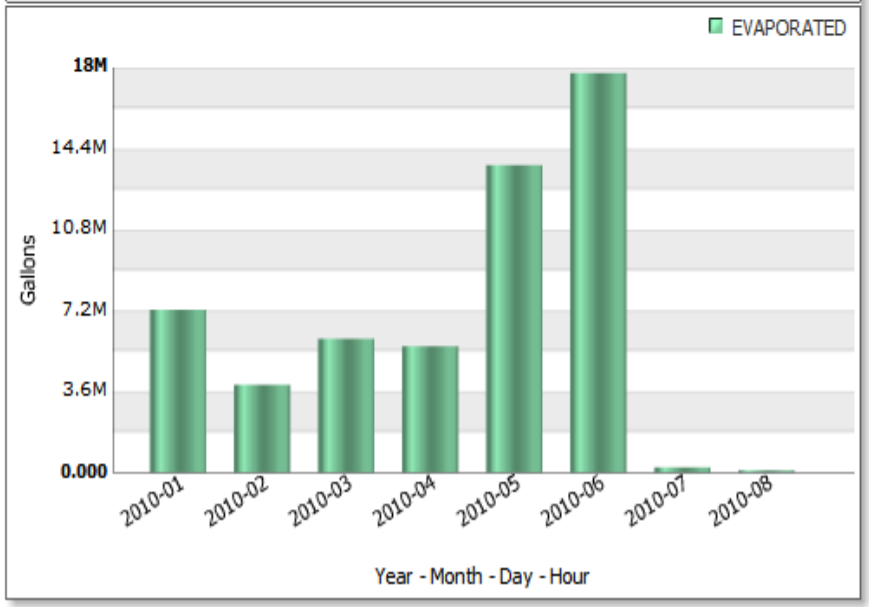
EFK : DISCHARGE COMPOSITE



EFK : DISCHARGE ACTUAL



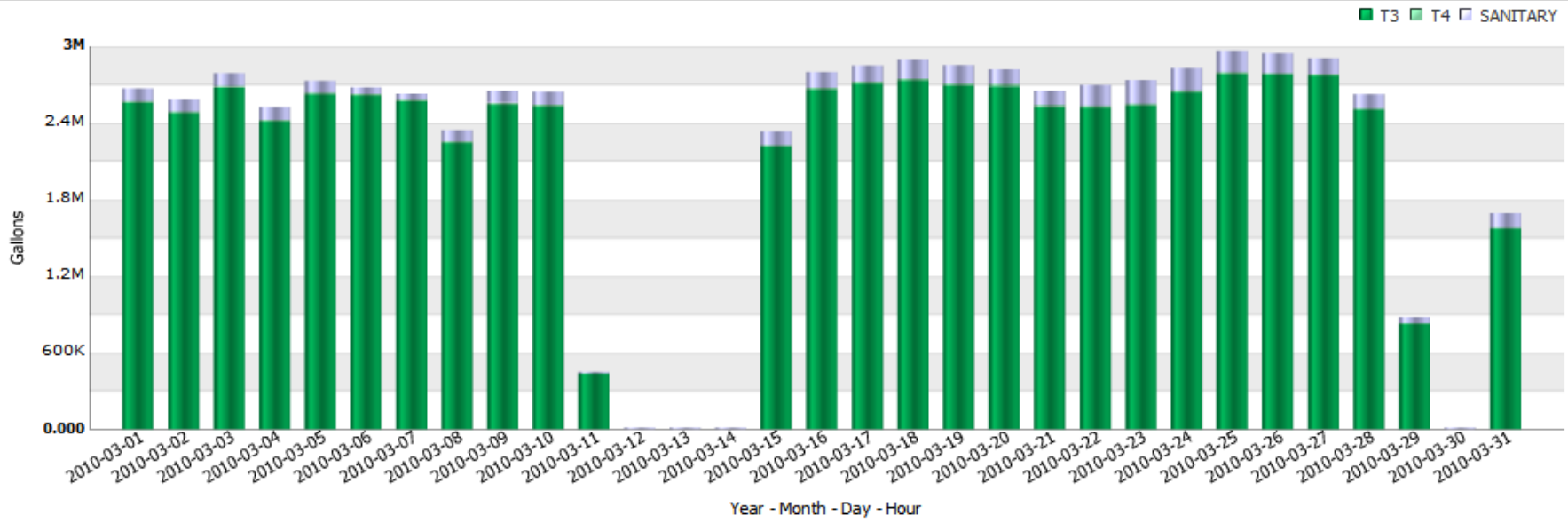
EFK : DISCHARGE EVAPORATED WATER



EFK : DISCHARGE COMPOSITE

Activities

Dimension Filters | Change Categories



Applied Filters:

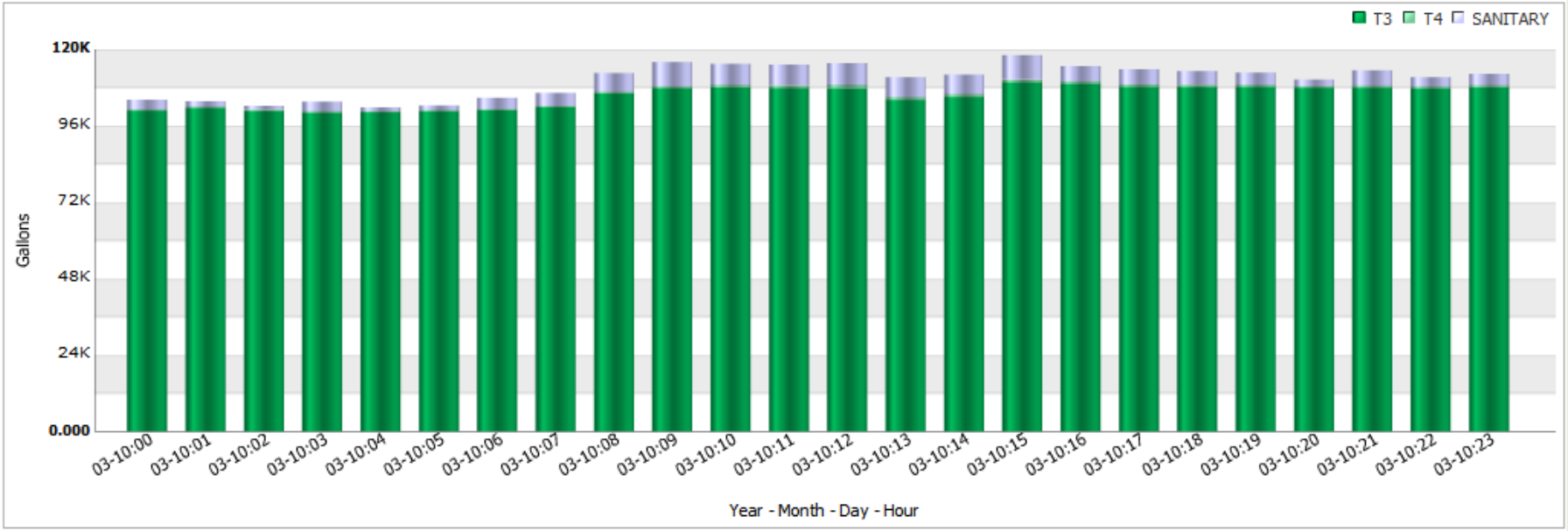
Dublin - DateTime DIM.Month = 2010-03
for Dublin - DateTime DIM.YEAR = 2010

"Day"	T3	T4	SANITARY
2010-03-01	2,556,849.606	15,232.668	97,576.662
2010-03-02	2,475,528.378	15,153.384	93,007.428
2010-03-03	2,678,712.162	14,135.922	98,966.64
2010-03-04	2,410,578.504	13,524.498	97,448.748
2010-03-05	2,624,473.926	14,315.304	92,895.894

T3 and T4 and SANITARY by "Hour"

Activities

Dimension Filters | Change Categories



Applied Filters:

Dublin - DateTime DIM.Day = 2010-03-10
for Dublin - DateTime DIM.Month = 2010-03 and Dublin - DateTime DIM.YEAR = 2010

"Hour"	T3	T4	SANITARY
03-10:00	100,746.312	508.23	2,977.5
03-10:01	101,547.906	542.496	1,650
03-10:02	100,664.112	525.516	1,020
03-10:03	100,006.662	555	2,940
03-10:04	100,201.428	433.332	1,140

Thank You!

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