





South Asia Regional Initiative for Energy Integration (SARI/EI)

## "SARI/EI and Key Activities Undertaken and Way Forward"

SAARC Perspective Workshop on the Past, Present and Future of High Voltage DC (HVDC) Power Transmission

30<sup>th</sup> Sept & 1<sup>st</sup> Oct,2015 Lahore, Pakistan























#### **Cooperative Agreement: Highlights**







#### South Asia Regional Initiative for Energy Integration (SARI/EI)

- ♦ SARI/E is a long standing program of USAID started in the year 2000.
- Program has consistently strived to address energy security in South Asia by focusing
  - 1) Cross Border Energy Trade
  - 2) Energy Market Formation and
  - 3) Regional Clean Energy Development.
- SARI/EI-Phase IV (2012-2017): Key Outcomes.

Three Key Development Outcomes:

- 1. Coordinate policy, legal and regulatory issues.
- 2. Advance transmission interconnections.
- 3. Establish South Asia Regional Electricity Markets.
- Demand Driven 'Bottom Up' Approach
- IRADe, a regional organization, is implementing partner







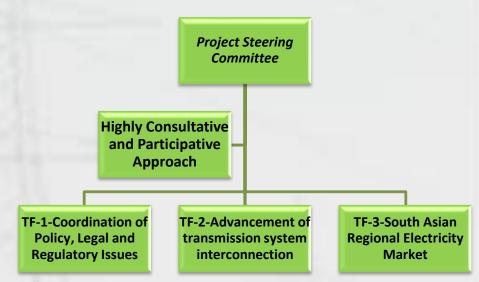


## **SARI/EI Framework**

- Project Steering Committee (PSC) is the apex body of the program and provides overall strategic directions.
- PSC members consist of Senior level officials from the country governments, SAARC, ADB, Independent Energy Experts/Diplomats.
- Three PSC meeting has been held.
- Three Task Force has been Constituted.
- Task Forces are represented by

  Government Nominated members from

  SA countries.



>TF1: Coordination of Policy, Legal and Regulatory issues



>TF-2: Advancement of transmission system interconnection



➤ TF 3: South Asian Regional Electricity

Market





## Demand Driven Studies /Exercises to Achieve the Deliverables of Task Forces as Defined in the Terms of Reference of Task Forces



Study -1: Ongoing study on review of the study on review of policies, regulations and laws, preparation regulations etc. (Draft Final Report finalized)

**Study-2:** on Investment policies/guidelines for SA countries ( to be initiated)



Study 1: Ongoing Study to find the Trading Potential of South Asian Countries (Draft Report has been prepared)



Study 2: Harmonization of Grid Codes (Draft Report Prepared)



Study 1: "Assessment and recommendation of commercial terms & conditions for Cross Border Electricity Trade (CBET) and suggesting the model Of Power Exchange in South Asian region" (Draft Report Prepared)

**Study 2:** Study on Market Rules and Pilot Market design. ( to be initiated)





## Combined Meeting of SARI/EI Task Forces (5<sup>th</sup> TF-1, 4<sup>th</sup> TF-2 and 2<sup>nd</sup> TF-3):Key Highlights

#### Combined Meeting -5th and 6th August, 2015

The findings of Demand Driven studies being conducted under all the three TFs were discussed and deliberated.

**TF-1:** Review of Electricity Laws, Regulations and Policies, Regional Regulatory Guidelines.

TF-2:Trading Potential and Harmonization Grid Code Studies (Development of Framework guidelines). TF-3: Commercial T & C, Model for Power Exchange.

SAARC Energy Centre (SEC) Participated in the meeting and Partnership with SAARC.

SEC and SARI/EI to closely work with each other to complement and supplement the activities. (Sharing of Studies and Joint Workshop)

SAFER-White Paper to be prepared on Regional Institutional Mechanism.

**SARI/EI** News Letter and News Mailer were lunched.



The Framework Guidelines will be comprehensive in nature and shall contain

Impact analysis Explanatory Implementation Draft code

The proposed framework shall not be intended to replace the existing national grid codes for non-cross border issues but to harmonise/Coordinate the critical issues concerning cross border trade.

Planning Guidelines

Connection Guidelines

Framework Guidelines

Operational Guidelines

The draft code can be adopted fully or in parts by the relevant authorities and can form the basis for harmonising the existing national codes in the identified areas for CBT. Capacity Allocation & Congestion management

Scheduling & Dispatch







Key Outputs of the Draft Final Report of the TF-1 Study on review of the "Study on review of policies, regulations and laws, preparation regional regulatory guidelines"

Analysis of Electricity Laws, Regulations and policies of SA countries.

Identified **minimum requirements/critical ingredients** required to facilitate CBET. .

Review of **international power pools and regional trade arrangements** and recommendations for South Asia.

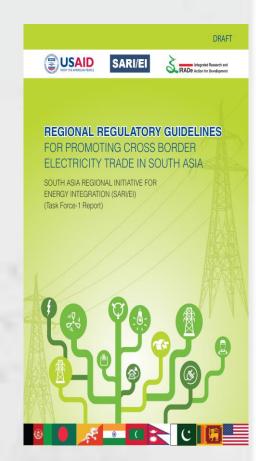
Analysis of Key risk areas in CBET and mitigation measures adopted in power pools/regions

**Regional Regulatory Guidelines** for Harmonization/coordination of Regulations along with **the Statement of Reason**.

Proposed **South Asian Forum of Electricity Regulators (SAFER)** to manage implementation process in close coordination with various regional bodies.

Proposed Changes and amendments in Electricity Laws, Policies and Regulations of South Asian Countries for promoting CBET in South Asian Countries.

Country wise Short Term, Medium Term and Long-term Road Map











# Dinner Meeting on Catalysing Cross Border Electricity Trade in South Asia: South Asia Forum of Electricity Regulators (SAFER) 05<sup>th</sup> August 2015

South Asia Forum of Electricity
Regulators
(SAFER)







Dinner Meeting on Catalysing Cross Border Electricity Trade in South Asia: South Asia Forum of Electricity Regulators (SAFER): Key Highlights and Way forward

Regulatory harmonization coordination is the key to advance CBET and bring investment.

International experiences suggesting a strong and robust regional regulatory institutional mechanism for harmonization and coordination of regulations.

Meeting Consensus: The need for a South Asia forum of regulators is necessary and crucial, as the region is witnessing great changes in CBET and requires more harmonization/Coordination of Regulations.

Need to find out the synergies between Existing Institutional mechanism.

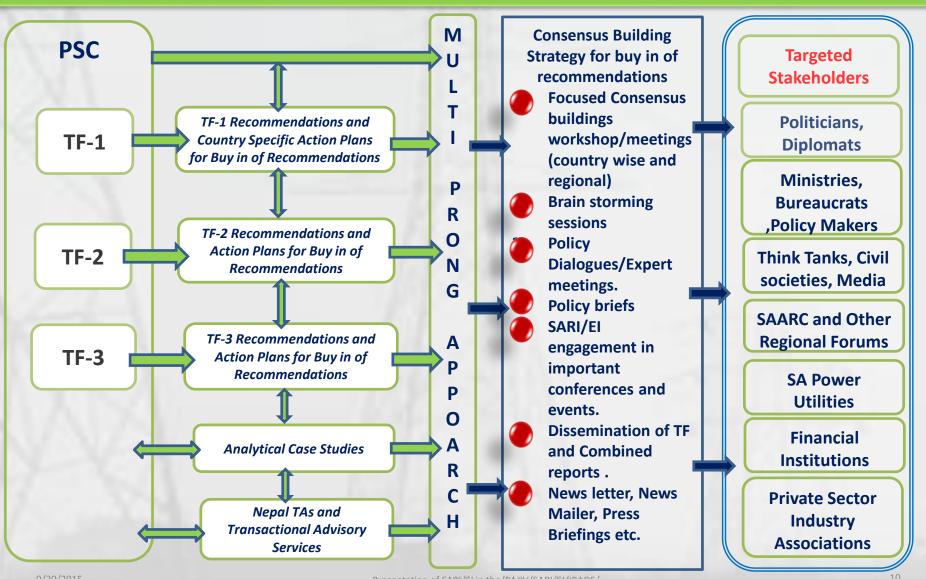
Needs to prepare a detailed white Paper on SAFER.

South Asia Forum of Electricity Regulators (SAFER)





#### SARI/EI Out Reach /Consensus Buildings Framework: Approach and Strategy









#### **Analytical Studies: Economic Benefits of India-Nepal CBET**



- Marco-Economic Economic Benefits of India-Nepal CBET.
- Impacts on growth and development and various sector of the economy of both countries.



Study is being conducted by IRADe





#### **SARI/EI: Major Accomplishments Since 2013-2014**

#### **Key Events:**

- 1) High level Inaugural conference of SARI/EI on 4th-5th October 2013, New Delhi, India
- 2) 2nd PSC Meeting on 8th Jan, 2014, New Delhi, India.
- 3) 3rd PSC Meeting on 17th -18th Dec, 2014, Dhaka, Bangladesh.
- 4) 2nd Meeting of TF-1 on 19th-20th Feb, 2014, colombo, Sri Lanka.
- 5) 3rd Meeting of TF-1 on 4th -5th June, at Thimphu, Bhutan
- 6) 4th Meeting TF-1 on 17th-18th Dec, Dhaka, Bangladesh.
- 7) 2nd Meeting of TF-2 on 16th-17th April 2014, Kathmandu, Nepal and 3rd Meeting of TF-2 on 25<sup>th</sup>-26th Feb, 2015, Colomo, Sri Lanka.
- 8) 1st Meeting of TF-3 on 29th-30th ,April, Mumbai, India
- 9) Study Tour to European Regional Power Market Amsterdam & Paris from 13th 19th July, 2014.
- 10) Investors workshop on Cross Border Electricity Trade 24th-25th Sept, 2014 at New Delhi, India.
- 11) Combined Meeting of SARI/EI Task Forces and SARI/EI Dinner Meeting on SAFER on 5th and 6th September, 2015.

  (Total of 12 Events)

#### **Publications:**

- 1) Back ground paper on "Prospects for Regional Cooperation on Cross-Border Electricity Trade in South Asia"
- 2) Inaugural Conference Proceedings.
- 3) Study Tour Report.
- 4) Concept Paper on "Cross Border Electricity Trade in South Asia: Investment Challenges and Opportunities"
  - 5) Investor Workshop
    Proceedings.
  - 6) Regional Regulatory
    Guidelines.
- 7) Annual Updates
- 8) News mailer and Newsletter







#### **SARI/EI: Way Forward**

- White Paper on Regional Regulatory Institutional Mechanisms (SAFER)
- Consensus Building Workshop on SAFER and Regional Regulatory Guideline (RRG).
- Investment Friendly Policy Guidelines and Regional Investment Framework (RIF).
- Consensus Building workshop on Harmonization of Grid Codes, operating procedures and standards and outreach of the framework guidelines.
- Institutional Mechanism/Forum for Regional Transmission System Operation/Load Despatch Centres (SAFTO).
- Standard PPAs and TSAs
- Pilot South Asia Power Market Design and Market Rules.
- Partnership with SAARC Energy Centre.







## Thank You





















#### **SARI/EI Inaugural Conference : Key Recommendations**

#### Electricity should be recognized as trading commodity

SA countries have different regulatory practices, which leads to difference in electricity pricing in the region. This calls for **need for harmonization/coordination** 

Need for advancing policy reforms at national level with special focus on taxation and duties.

To establish **guidelines for trade and dispute resolution mechanism** as pre requisite for establishing energy market

Requirement of investors to take up large projects in hydro sector for sustainable cash flows which can be done by **investment friendly policies** in the region.

The grid codes and technical standards need to be coordinated to ensure reliable regional power system operation.

Requirement of **South Asia regional power grid** and establishments of power exchange.



South Asia Regional Inaugural Conference of SARI/EI on "Cross-Border Electricity Trade"



South Asia Regional Inaugural Conference of SARI/EI on "Cross-Border Electricity Trade" 4th-5th October, 2013







#### **Investors Workshop on Cross Border Electricity Trade: Key Recommendations**

Building Political Consensus and Institutionalization of the process through Intergovernmental Agreement to Promote CBET.

**Evolving a Regional Investment Policy Framework and creating investor friendly policies and guidelines.** 

Creation of Regional Grid Master Plan.

Harmonized Grid Codes and Operation procedures for regional power system operation.

**Regional Electricity Regulatory Forum/Associations.** 

Establishing Competitive Regional Electricity Market.







CIII

Cross-Border Electricity Trade in South Asia: Challenges and Investment Opportunities



South Asia Investor's Workshop on 'Cross-Border Electricity Trade' 24-25 SEPTEMBER 2014, NEW DELHI, INDIA





#### **Key Highlights of the European Market**

Vision of EU: Single Integrated Electricity Market. Energy Union

**Power Exchange(PXs):** Each country has its own Power Exchanges and they act as a nodal for Cross Border Transactions and Settlements

**Price Coupling(PC):** PC is solution to couple markets by different power exchanges of the Europe: Covers the technical, legal, operational

**Price Coupling of Regions:** Ensures that each PX runs the same common aloghotrhim with same data and configuration. PXs: Each PX is connected TSO for Capacity Information.

**Capacity Allocation:** Capacity Allocation Service Company( CASEC) is the nodal company in Europe which gives the right to import or export electricity over a interconnector on Behalf of TSOs.

**Role TSO:** 1) Construction and Maintenance 2) System services, Balances between Supply and Demand 3) Market Facilitation:-Stable Electricity Market.

**Balancing Market**: Imbalance Management is the responsibility of the TSO. TSO collects bids for both Up and Down regulation. Settlement Mechanisms:-Cost of Managing imbalances is borne by the Causer of Imbalance.

32 interconnected countries of Europe

Total Installed capacity850 GW

Consumption: 3,400
TWh/year

Peak Load : 500 GW

Physical exchanges( 2012): 400 TWh/year

(12% total consumption)

Population: 500

**Million** 



The study tour was organised by IRADe in association with the **Indian Energy Exchange(IEX)**, a leading power exchange in India, with a combination of class room training as well as site visits.



#### **Study Tour: Key Lessons Learnt**

**Long-term bilateral contracts**: The process of Cross Border electricity Trade initiated with long term bilateral contracts.

Organic Growth: Step by Step Approach

**Strong Political Mandate.** Strong political mandate gave a clear road map at European Union (EU) level which translated in to conducive legal, regulatory and policy framework.

**Coordination of regulations and Forum of Regulators.** To ensure effective coordination of regulations, **Agency for Cooperation of Energy Regulators (ACER)** was formed as an EU body in 2010

**Bottom up approach.** Market Integration vis-a-vis market couplings were industry pushed, which were subsequently adopted/formalized by EU.

**Coordinated Power Exchanges:** National power exchanges of EU countries coordinates among each other on a common platform for the purposes of cross border electricity trade transactions. **No regional power exchange as such.** 

**Access to network:** Non Discriminatory open access to network and access to cross border interconnectors has been made completely market based. Exclusive rights to cross-border capacities have been abolished by EU.

Role of Government in Building Cross Border Trade Infrastructure: Push for cross border interconnections, largely supported/funded by the Governments but on purely commercial principles.

**Market Creations:** EU laws are mandated to allow choice of suppliers to all their consumers. Therefore, vibrant electricity markets evolved within countries.









#### **Project Steering Committee(PSC) Meeting: Key Highlights**

2<sup>nd</sup> PSC meeting ,8th January, 2014, New Delhi, India: Key Findings

Emphasized the need for building political consensus

Agreed on the need of Demand Driven studies to be carried out to achieve deliverables of the Task forces.

**AWP 2013-14 Discussed and Finalized** 

To bring synergies, Agreed to have Coordinated Project Steering **Committee and Task Forces Meetings.** 

PSC meeting, 17th -18th December, 2014 Dhaka, Bangladesh: Key Findings

Strategic Buy in Task Force Recommendations: Consensus Building Worksop.

Need to work with SARRC.

Agreed to carry out the study on Investment Friendly Policy **Guidelines** 

AWP 2014-15 Discussed and Finalized, Analytical study will be undertaken









Task Force-1 on "Coordination of Policy, Legal & Regulatory Framework" Meetings:

Key Highlights

#### 1st TF-1 Meeting24th- 25th July, 2013 Dhaka, Bangladesh

TOR TF-1, Deliverables and working Methodology Finalized

**Intergovernmental Treaty is starting Point.** Need for an **effective regulatory regime.** 

**Investment Protection: Need for Legal, Contractual, Regulatory measures** 

Member desired to carry out detail study on review of Electricity laws, policies and regulations



#### 2nd TF-1 Meeting 19th-20th February, 2014, Colombo, Sri Lanka

Country wise Key Legal, Regulatory and Policy issues deliberated.

Specific provisions in EAs relating to CBET are extremely important.

Trading Licenses are required for smooth and legally tenable CBET.

**Non Discriminatory open access is extremely important** for enhancing Private sector and competition.

Scope of the Study Discussed and were finalized.







## TF-2 on "Advancement of Transmission System Interconnection" Meetings: Key Highlights

1<sup>st</sup> Meeting of TF-2, 21<sup>st</sup> – 22<sup>nd</sup> August 2013 | Thimpu, Bhutan

ToR of TF-2, working Methodology, Deliverables finalized

Planning, Technical and operational aspects of system interconnections were presented and discussed.

Need to develop coordinated system operating procedures and to Identify the relevant provisions in the grid codes.



#### 2<sup>nd</sup> Meeting of TF-2,16th - 17th April, 2014, Kathmandu, Nepal

Presentation and discussion on "Infrastructure Financing in South Asian Power Sector" and "Features of Indian Electricity Grid Code"

ToR of the studies on "Trading Potential" and "Harmonization of Operating Procedures such as Grid codes ,standards, etc." deliberated.

Need to have Regional Transmission Master Plan. Transmission and Generation Plan related to Regional Power Trade needs to be coordinated.







## TF-2 on "Advancement of Transmission system Interconnection" Meetings: Key Highlights

3rd Meeting of TF-2, 25th - 26th February, 2015 | Colombo, Sri Lanka

Consultant presented Preliminary Findings of Study on Trading Potential were presented and discussed.

**Consultant** to revise the report based on the member's comments and observations.

Need for Regional Transmission Master Plan for regional power trade.









## TF-2 on "Advancement of Transmission system Interconnection" Meetings: Key Highlights

3rd Meeting of TF-2, 25th - 26th February, 2015 | Colombo, Sri Lanka

Consultant presented Preliminary Findings of Study on Trading Potential were presented and discussed.

**Consultant** to revise the report based on the member's comments and observations.

Need for Regional Transmission Master Plan for regional power trade.







## TF-3 on "South Asian Regional Electricity Market" Meeting: Key Highlights

#### 1st Meeting of TF-3,29th-30th April,2014, Mumbai

The ToR of TF-3 was discussed and finalized.

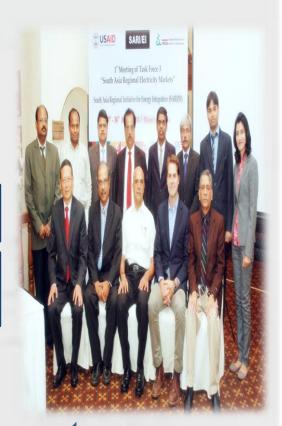
Presentation and deliberation on 1) Evolution and Commercial aspects of power trading in India 2) Important terms and conditions of long term PPAs 3) Power Market in India 4) country Experiences with respect to power trading in SA.

Need of having a standard PPAs/TSAs is very crucial for CBET.

Importance of **UI and ABT mechanism** discussed, **challenges of balance settlement in Regional context** highlighted.

Need to review the various commercial terms and condition w.r.t to CBET in South Asia.

IRADe to prepare a road map for achieving the deliverables of tf-3.











## **Roadmap for TF-3 (Phases)**



Phase-1 Assessment of Preparedness of each SA nation and identification of Commercial Principals / aspects required for regional electricity market.



Phase -2 Development of Market Rules and Pilot market design etc. (six months from the completion of phase 1)



Phase-3 Running and Finalization of Pilot Market. (Setting up of Pilot Market, Running of Pilot market, finalization of market rules etc. Anticipated completion by 2016/17)







#### SARI/EI: Major Accomplishments Since 2013-2014

- ✓ Organised high level Inaugural conference of SARI/EI on 4<sup>th</sup>-5<sup>th</sup> October 2013, New Delhi, India
- ✓ Back ground paper on "Prospects for Regional Cooperation on Cross-Border Electricity Trade in South Asia"
- ✓ Conference Proceedings
- ✓ Successfully obtained **Government of India's Nomination** to the PSC and Task Force
- ✓ PSC Meeting: 2<sup>nd</sup> PSC Meeting: organised on 8th January, 2014, New Delhi, India.
   : 3<sup>rd</sup> PSC Meeting: organised on 17<sup>Tth</sup> and 18<sup>th</sup> December, Dhaka, Bangladesh.

#### ✓ Task Force 1:

- 1. 2nd Meeting of Task Force-1 organised on 19th & 20th February, 2014, colombo, Sri Lanka.
- 2. **3rd Meeting of Task Force-1** organised on 4<sup>th</sup> and 5<sup>th</sup> June, at Thimphu, Bhutan
- 3. **TF-1 study** on Review of Electricity Laws, Regulations, Policies (EL&R&P) of SAC (South Asia Countries) to Mercados Energy Private Limited
- 4. 4<sup>th</sup> TF-1 Meeting Task Force-1 organised on 17<sup>th</sup> &18<sup>th</sup> December, Dhaka, Bangladesh.

#### √ Task Force 2:

- 1. 2nd Meeting of Task Force-2 organised on 16th 17th April 2014, Kathmandu, Nepal.
- 2. TF-2 study on "Assessment of the Electricity Trading Potential" of the South Asian Countries"
- 3. 3<sup>rd</sup> Meeting of Task Force-2 organised on 25th & 26th February, 2015, Colomo, Sri Lanka.
- 4. TF-2 study on Harmonization of Grid Codes.

#### √ Task Force 3:

- 1. Constitution of TF-3
- 2. 1st Meeting of Task Force-3 organised on 29th -30th, April, Mumbai, India
- 3. Road map for TF-3
- ✓ Organised **study tour to European Regional power market** Amsterdam & Paris from13th to 19th July, 2014.
- ✓ Organised Investors workshop on Cross Border Electricity Trade 24<sup>th</sup>-25<sup>th</sup> Sept,
   2014 at New Delhi, India.
- ✓ Concept Paper on "Cross Border Electricity Trade in South Asia: Investment Challenges and Opportunities"
  - Combined Meeting of SARI/EI Task Forces and SARI/EI Dinner Meeting on SAFER on 5th and 6th September, 2015.







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Country wise Key Legal, Regulatory and Policy issues deliberated.

Specific provisions in EAs relating to CBET are extremely important.

Trading Licenses are required for smooth and legally tenable CBET.

**Non Discriminatory open access is extremely important** for enhancing Private sector and competition.

Scope of the Study Discussed and were finalized.









## Task Force-1 on "Coordination of Policy, Legal & Regulatory Framework" Meetings: Key Highlights

3<sup>rd</sup> Meeting of TF1,4<sup>th</sup>-5th June, 2014 ,Thimphu,Bhutan.

**Consultant Presented Initial findings of TF-1study** 

Risk Analysis, international best practices needs to be carried out.

Need to have **synergies among all the three Task** Forces to ensure that derivable of TF-2 and TF-3 are achieved within the overall legal, regulatory and policy set up which are being framed by TF-1.



Draft Findings of the TF-1 study covering International review were presented, deliberated.

Need to develop Regional Regulatory Guidelines and appropriate institutional mechanism.

**Need to identify the changes/amendments** required in Electricity Acts, Policies and regulations .

Need to Carry out 2<sup>nd</sup> TF-1 study Regional Investment Policy guidelines and Regional investment framework.









Combined Meeting of SARI/EI Task Forces ( 4th Meeting of TF-2): Key Highlights and Way forward

#### **Combined Meeting: 4th TF-2 Meeting: Key Highlights**

TF-2 study on Trading Potential were presented and deliberated.

Result needs to be Realistic and Need to develop Modelling Scenarios

Draft Findings of the TF-2 study on Harmonization of Grid Codes Presented and Deliberated.

Needs to Develop comprehensive framework guidelines on Planning, Operationn, Connection, Capacity Allocation & Congestion, Scheduling & Dispatch.

#### **Combined Meeting: 5th TF-1 Meeting: Way Forward**

Finalization of the report on Trading Potential after incorporating comments.

Finalization of the report on harmonization of grid codes after incorporating comments.

The framework Guidelines will be comprehensive in nature and will encapsulates 1) Impact analysis 2) Explanatory statement 3) Implementation Provisions and 4) Draft code.

Visit to the Load Centres to understand operational philosophy, scheduling and despatch procedures for Preparation of Guidelines by PRDC and IRADe.



