

CO-LaN Activities Report 2018/2019

AGM of CO-LaN 2019
Shell Technology Centre Amsterdam
October 23, 2019

CO-LaN Activities Report 2018/2019

CO-LaN Overview

- Current Members & Management Board
- Contracts and Software Licences

Usage & awareness

- Website, forum, new publications, training

Special Interest Groups: overview and deliverables

Strategic activities:

- CAPE-OPEN certification
- Consultancy Service Scheme
- CAPE-OPEN middleware (COBIA)

CO-LaN Overview – Membership

❑ **As of September 2019 more than one hundred Members**

⇒ 6 Full Members

⇒ 80 Corporate Associate Members

- 50 Suppliers and/or consultants
- 27 Academics
- 3 Public & Federal Agencies

⇒ 22 Individual Associate Members

- MAYER, Hans-Horst (original CAPE-OPEN member) has left

❑ **New members 2018/19**

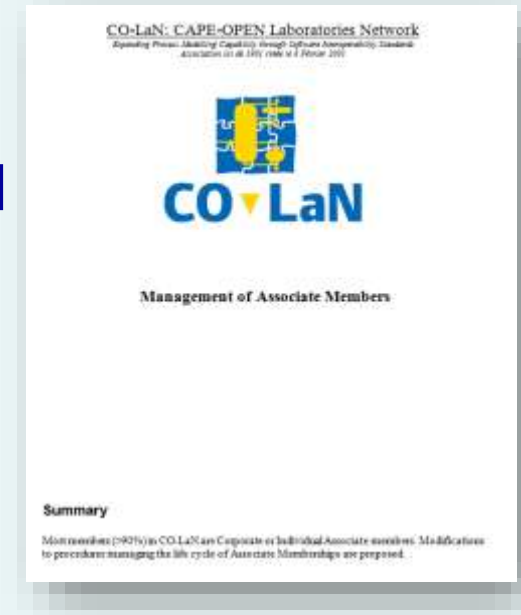
⇒ Capital Gain Consultants

⇒ JONES, Mark Nicholas

CO-LaN Overview – Membership

- ❑ **CO-LaN expects each Member to assist in its missions and to contribute to its life.**

- ❑ **A membership procedure is followed to maintain contact with an active CAPE-OPEN community**
 - ⇒ Approval of new members
 - ⇒ Confirmation of Associate Membership
 - ⇒ Cancellation of Associate Membership
 - ⇒ Activity tracking



The procedure was released for comment on January 13th, 2019 & has been reviewed by several members

CO-LaN Membership fees

- ❑ Future major spending are on
COBIA, test suite, certification & CTO succession plan
- ❑ Unsustainable funding model
(projected deficit for the coming years > 30kEuros)

The intention to introduce associate membership fees for the next lifetime period of CO-LaN (2021 – 2026) to accelerate the current developments

CO-LaN Membership fees

- ❑ Proposed model for membership fee:
 - ❑ Full members: 10kEuros
 - ❑ Corporate associate members: 2kEuros
 - ❑ companies with fewer than 20 employees 100 Euros
 - ❑ Individual associate members are free of charge

- ❑ Additional benefits: access to test suite & certification will be discounted or for free.

- ❑ Final decision will be taken by year end 2019
- ❑ Announcement to be expected January 2020
- ❑ First fees will be requested in 2021

Please provide us your feedback

CO-LaN Overview - Management Board

- ❑ **Responsible for day to day running of CO-LaN**
- ❑ **Composed only of representatives of Full Members**
- ❑ **Management Board (current)**
 - ⇒ Shell Global Solutions Richard Baur (President and Secretary)
 - ⇒ Air Liquide Philippe Arpentinier (Treasurer)
 - ⇒ BASF Norbert Asprion (replacing Peter Mauer)
 - ⇒ BP Kathryn Yearsley (replacing Mick Lee)
 - ⇒ Dow Michael Berger (replacing Isaiah Huang)
 - ⇒ Linde Oliver Koch
- ❑ **Monthly conference calls of 1½ h, plus twice yearly physical meetings and additional meetings on specific topics.**

CO-LaN Daily Operations

Annual contracts awarded by CO-LaN

☐ Michel Pons Technologie, CTO

⇒ Administration, SIG management, interoperability testing etc.

☐ Michael Halloran

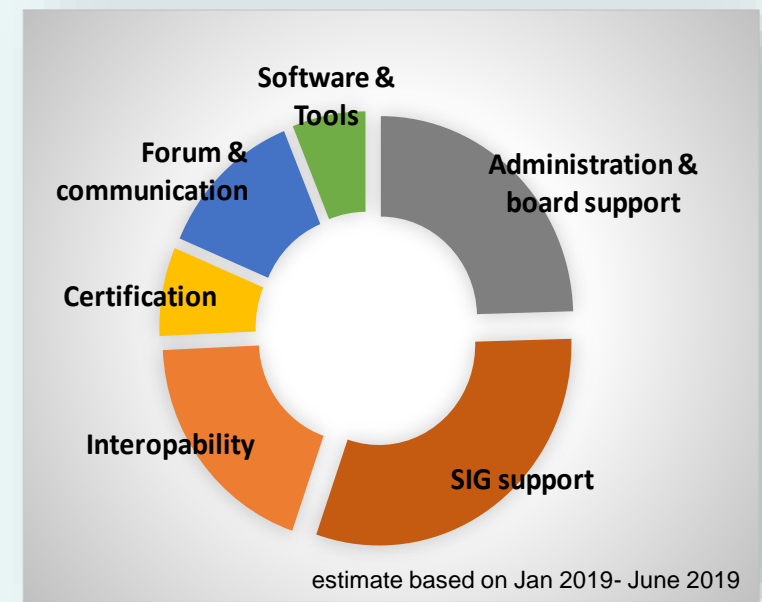
⇒ COLTT & Type Libraries/PIA

☐ Stenhouse Simulations Ltd

⇒ Secretarial support

☐ MRW Consulting

⇒ Project lead for certification & testing suite



Project related contracts awarded by CO-LaN

⇒ AmsterCHEM

- Consultancy service schemes
 - AspenTech
 - OGT
- COBIA – consultancy service schemes
 - HTRI
 - KBC
- COBIA course

CO-LaN Overview - Contracts & Licenses

- ❑ **2019 CO-LaN Laptop has been purchased by Michel Pons Technologie and leased to CO-LaN**

- ❑ **Licenses for testing & demonstration**
 - ⇒ *All major vendors have continued to provide licenses to CO-LaN*
 - *For testing & demonstration purposes*

- ❑ ***Results of the testing are kept confidential to the vendor, the CO-LaN contractors and the Management Board***

CAPE-OPEN usage and awareness

□ Numerous articles refer to, or use CAPE-OPEN, e.g.

- ⇒ Zhou J., Kooijman H.A. & Taylor R. (2019). A rate-based equation-oriented parallel column model: Application to dividing wall columns. *Journal of Chemical Engineering Research and Design*, vol. 146, pp. 48-59.
- ⇒ Hillestad, M., Ostadi, M., Alamo Serrano, G. D., Rytter, E., Austbø, B., Pharoah, J. G., & Burheim, O. S. (2018). Improving carbon efficiency and profitability of the biomass to liquid process with hydrogen from renewable power. *Fuel*, 234, 1431–1451.
- ⇒ Corredor, E. C., Chitta, P., & Deo, M. D. (2019). Techno-economic evaluation of a process for direct conversion of methane to aromatics.
- ⇒ Braz, C. G., Mendes, A., Rocha, J., Alvim, R., & Matos, H. A. (2018, February 23). Model of an industrial multitubular reactor for methanol to formaldehyde oxidation in the presence of catalyst deactivation.

... see <http://www.colan.org/category/techpapers/>

**Please make CO-LaN aware of publications
& mention CAPE-OPEN technology when using it.**

CO-LaN Repositories

CO-LaN uses repositories for

- ⇒ Storing working documents of SIGs & MB
- ⇒ Delivering software and documentation
 - Tools such as COLTT or TLB/PIA installers
 - Project deliverables: COBIA
 - Examples, complete documentation sets
- ⇒ Managing software development
 - COLTT, COBIA, TLB/PIA installers

Members, please **check you have access to the repositories**



The screenshot shows the CO-LaN website interface. At the top, there is a logo and the text "CO-LaN". Below that, a message states: "This set of repositories is dedicated to the CAPE-OPEN industry standard for process simulation software. It is intended for use by any of the public projects contained in this set." A section titled "Projects (4)" includes a filter input field. The list of projects includes:

- CAPE-OPEN IDL**
coldi / svn / 94.2 MB / Last Commit: 05 Jul 2016 21:35
Project related to managing and delivering the CAPE-OPEN IDL and Type Libraries
- CAPE-OPEN Logging and Testing Tool**
coltt / svn / 61.4 MB / Last Commit: 18 Jul 2016 22:35
Project to maintain and distribute the CAPE-OPEN Logging and Testing Tool.
- CAPE-OPEN Tester Suite**
cotester / svn / 8.6 MB / Last Commit: 14 Aug 2016 20:49
The CAPE-OPEN Tester Suite permits the test of COM software components implementing interface specifications of the CAPE-OPEN standard.
- Examples**
examples / svn / 22.1 MB / Last Commit: 08 Mar 2016 21:20
Project for the source and distribution of CAPE-OPEN example software developed by CO-LaN.



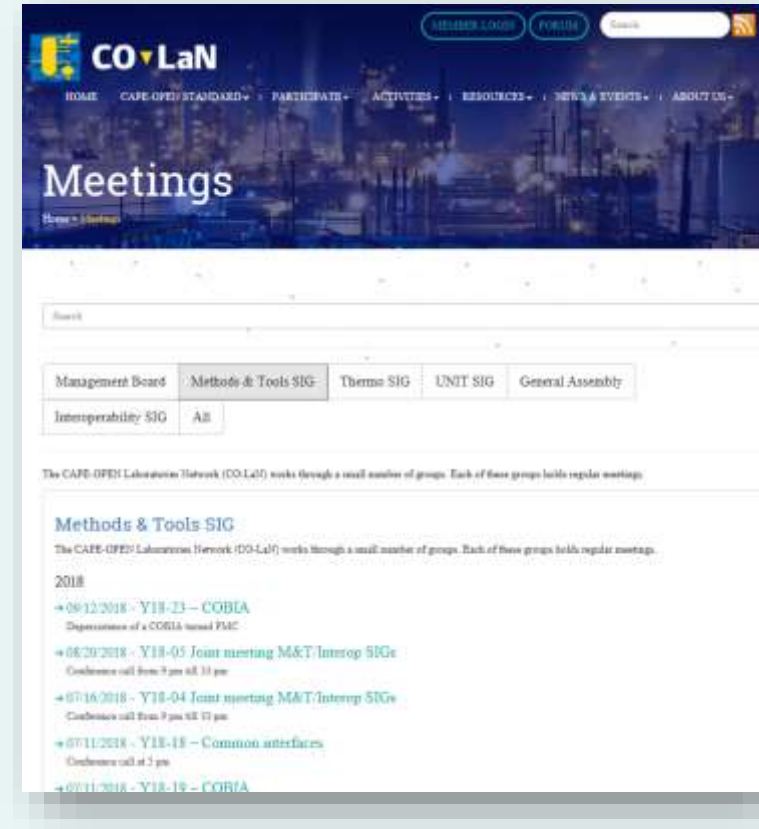
The screenshot shows the navigation bar of the CO-LaN website. It features the CO-LaN logo on the left, followed by a navigation menu with the following items: HOME, CAPE-OPEN STANDARD, PARTICIPATE, ACTIVITIES, RESOURCES, NEWS & EVENTS, and ABOUT US. On the right side of the navigation bar, there are buttons for "MEMBER LOGIN" and "FORUM", a search input field, and an RSS feed icon. A red arrow points from the "MEMBER LOGIN" button in this screenshot to the "MEMBER LOGIN" button in the screenshot above.

CO-LaN website & wiki

❑ CO-LaN Website

- ⇒ Over 1200 Posts
- ⇒ Subscribe via RSS
- ⇒ Sign up for the CAPE-OPEN Newsletter that pushes the most relevant Posts to its subscribers, once per month
- ⇒ Continuous updates on SIG activities
- ⇒ Check posts/entries about your PMEs and PMCs and contact CTO for up-dates

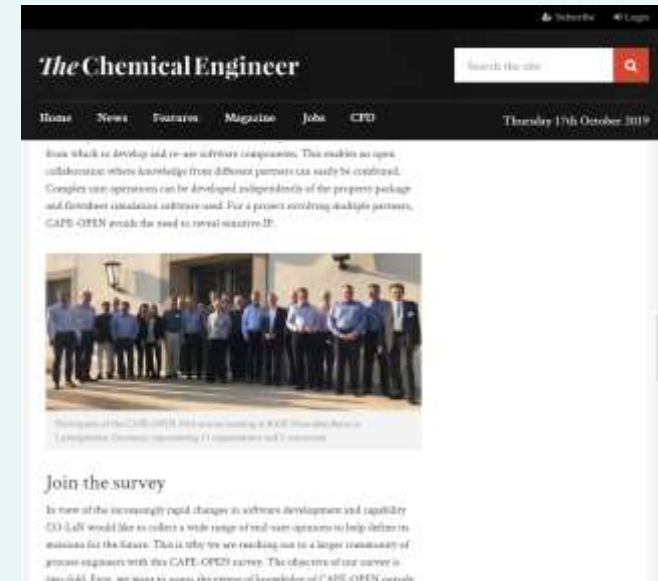
❑ CAPE-OPEN Wikipedia entry (last minor update June 2019)



CAPE-OPEN Survey

- ❑ Closed March 2019
- ❑ Advertised survey with an article in Chemical Engineer
- ❑ 87 participants
(small increase over October 2018)

















⇒ Approximately 1/3 were new contacts for CO-LaN



CAPE-OPEN forum

Objective: To allow CAPE-OPEN experts to answer queries

- ⇒ Use of COCO, development of PMCs such as Unit Operations and Property Packages.
- ⇒ Target audience: mainly developers
- ⇒ In active use for support queries
 - Number of users: 201 (169 last October)
 - Number of topics: 363 (305)
 - Number of posts: 1858 (1640), approx. one post per business day

GENERAL	TOPICS	POSTS	LAST POST
 Howto TAKE THE CAPE-OPEN SURVEY AND JOIN US AT THE CAPE-OPEN 2018 ANNUAL MEETING	7	12	by colancto  12 June 2018, 07:50
FORUM	TOPICS	POSTS	LAST POST
 Process Modelling Components Discusses use of CAPE-OPEN compliant Process Modelling Components Moderator: jasper	42	193	by jasper  21 August 2018, 09:00
 Process Modelling Environments Discusses use of CAPE-OPEN compliant Process Modelling Environments	251	1478	by Rodrigo  27 September 2018, 19:54
 Implementation and development	19	102	by jasper  31 July 2018, 16:40
 CAPE-OPEN Interface specifications	4	16	by bcbooo  04 September 2018, 08:43
 Activities of Special Interest Groups Contains discussion threads managed within each Special Interest Group at CO-LaN	24	29	by colancto  12 June 2018, 08:00
 Dissemination actions Discusses opportunities to communicate about use and implementation of CAPE-OPEN interfaces in PMCs and PMEs	14	16	by colancto  07 July 2018, 13:13
 News CAPE-OPEN related news	2	9	by jasper  25 September 2017, 07:21

Overview - SIGs

- ❑ **Responsible for maintenance and development of CAPE-OPEN interface standards**
- ❑ **Representatives of both Full and Associate Members**
 - ⇒ Interoperability
 - Leader: Malcolm Woodman
 - ⇒ Methods & Tools
 - Leader: Bill Barrett (USA EPA)
 - ⇒ Thermodynamics
 - Leader: Sergej Blagov (BASF), Jasper van Baten (AmsterCHEM)
 - ⇒ Unit
 - Leader: Krishna Murthy Penukonda (AVEVA)

Overview - SIGs

- ❑ **Member involvement in SIG meetings represents:**
 - ⇒ Thermo SIG: 8 man-hours per month
 - ⇒ Unit SIG: ½ man-hour per month (limited progress since Q2)
 - ⇒ Methods & Tools SIG: 6 man-hours per month
 - ⇒ Interoperability SIG: 1 man-hour per month

- ❑ **Plus whatever is done outside meetings...**

- ❑ **Tendency is to do more outside online meetings**

Thermo SIG progress report

❑ Activities 2018-2019

- ⇒ Errata Thermo 1.1: Diffusion coefficients and more
- ⇒ Custom Data interface specification: RFC complete
- ⇒ Chemical Reactions interface specification v1.1
 - Finalized heat of reaction, introduced Reduced Reaction set
 - Ready for RFC except for revision of Manager Common Interface
- ⇒ Proposed revised Material Template System

❑ Outlook 2019-2020

- ⇒ RFC + Publish Chemical Reactions interface specification v1.1
- ⇒ Develop Manager Common interface with M&T SIG
- ⇒ COBIA support

Unit SIG

Update on Petroleum Fractions specification

- Clarified the process of modifying Petroleum Properties
- Extensive review of the table listing the names of Petroleum Properties and their main methods of measurement
- Standardized way to name a method has been developed and included in the textual specification
- RFC is pending

M&T SIG 2018/2019 Summary of Activities

Update Interface Specifications

□ Simulation Context List of Named Values

- ⇒ Flowsheet Monitoring
- ⇒ Revised Persistence Interfaces
- ⇒ Revised Parameters Interfaces
- ⇒ Economics/Currency Interfaces
- ⇒ Revised Reporting Interface

⇒ COBIA Development and Testing

- ⇒ End-User Redistributable and SDK installers
- ⇒ Threading Model
- ⇒ Transitioning of persisted objects from COM to COBIA.

◆ Interaction with Interop SIG

- ⇒ Installer Support
- ⇒ Versioning

Interoperability SIG

- ❑ **Code Signing certificate renewal**
- ❑ **64-bit vs. 32-bit software**
 - ⇒ 64-bit PME with 32-bit PMC (and vice-versa)
 - ⇒ Which TLB/PIA version should be installed
- ❑ **TLB/PIA Installer**
 - ⇒ Robustness of installer
 - ⇒ Licence and creation of derivative works
- ❑ **Versioning**
 - ⇒ Final proposal still under discussion with M&T
 - ⇒ Inclusion of Flowsheet Monitoring and Custom Data
 - ⇒ Handling the deprecation of Thermo 1.0
- ❑ **COLTT**
 - ⇒ Addition of Info & Energy Ports / Streams
 - ⇒ Upgrade to latest version of Visual Studio
 - ⇒ Release by end 2019

Deprecation of Thermo Version 1.0

Thermo Version 1.0 was depreciated by Dec. 31st 2018

- ❑ **CO-LaN no longer maintains version 1.0 of the Thermodynamic and Physical Properties interface specification**
 - ⇒ No further errata and clarifications on this specification will be issued
 - ⇒ No revision of the interface specification document will be made.

- ❑ **Deprecation is not intended to make interoperability stop:** Thermo 1.0 will remain in Version 1.1 to ensure backwards compatibility

- ❑ **Specification visitors are directed to Thermo version 1.1.**

Certification – Business Requirements

❑ Coverage:

- ⇒ Levels of testing
- ⇒ Business model
- ⇒ Certification Process
- ⇒ Development of Software

❑ Work Process

- ⇒ Conference calls with
 - Vendors
 - End-users
- ⇒ Limited response to requests for input
- ⇒ Development of Proposals

❑ Presentation & discussion at this meeting

Certification – Technical requirements

❑ Coverage

- ⇒ Basis of development of Test Suite
- ⇒ Scope & methodology of testing
- ⇒ Order of Test Suite development
- ⇒ Process for development of Test Suite

❑ Work Process

- ⇒ Steering Group, 6 representatives of CO-LaN Full & Associate members
- ⇒ 6 x 2 hour phone conferences
- ⇒ Documentation of outcomes
- ⇒ Development of additional material

Consultancy Service Scheme (2019/2020)

❑ AspenTech

- ⇒ Providing a code example of a CAPE-OPEN Unit Operation
- ⇒ Advise on creating a CAPE-OPEN Unit Operation from scratch, and help to resolve issues encountered
- ⇒ Help to resolve a number of defects related to the implementation of CAPE-OPEN interfaces in Aspen Plus

❑ OGT

- ⇒ Support for making ProTreat a CAPE-OPEN unit operation: design and implementation of the mapping between a CAPE-OPEN Material Object and ProTreat®, including compounds mapping.

Consultancy Service Scheme (2019/2020) related to COBIA :

□ KBC

- ⇒ Provide guidance and support to KBCAT on the wrapping of Multiflash as a CAPE-OPEN thermodynamic server using COBIA

□ HTRI

- ⇒ Provision of guidance and support for the wrapping of Xfh Ultra (detailed fired heater simulation) as a CAPE-OPEN Unit Operation using COBIA

COBIA license proposal

Modified BSD 3-Clause License

Preamble: The primary purpose of this Society shall be to promote the use and the development of the CAPE-OPEN standard in Computer-Aided Process Engineering (CAPE) software, and more generally to encourage all actions aiming at facilitating the use of CAPE software tools in industry, administration and academia.

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Distribution to membership once licence scheme resolved

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Review of Milestones from AGM 2019:

□ CAPE-OPEN certification

- ✓ Establish technical steering group
- Develop charter for SIG
- Strategic plan for SIG formation

□ Testing Suite

- ✓ Develop vision for self-testing suite
- × Commission prototype

□ COBIA

- ✓ Support for two initial implementations (KBC & HTRI)
- Phase III: M&T SIG to refine implementation plan over the next years
- × Phase III: Start with implementation

□ Consultancy Service Scheme 2019

- ✓ support for OGT & AspenTech
- ✓ support for COBIA implementations (KBC & HTRI)

Milestones for 2020

- ❑ **Decision on extension of CO-LaN for 2021-2026**
 - ❑ Ratification of the funding model and modifications to the bylaws

- ❑ **CAPE-OPEN certification**
 - ❑ Continue to develop a business model
 - ❑ Start to develop test suite

- ❑ **COBIA**
 - ❑ Gather feedback from prototype implementations
 - ❑ Start with COBIA Phase III

- ❑ **Consultancy Service Scheme is on hold in 2020**
 - ❑ Evaluation of benefits to CAPE-OPEN community from previous Consultancy Service Schemes

How you can help

- Contribute to the CAPE-OPEN certification process**
- Contribute solutions for CAPE-OPEN self-test suite**
- Evaluate and feedback on COBIA**
- Participate in SIGs**
- Feedback on website and CAPE-OPEN wiki page**
- Promote CAPE-OPEN to your colleagues & customers**

Comments, Questions?