

Northern Australia Section Report 2020

PART A - SECTION SUMMARY

A.1 Executive Summary

- **Section Executive Committee Member List**

Position	2020 Incumbent
NA Section Chair	Melanie Olsen
NA Section Vice Chair	Wei Xiang
Treasurer	Mostafa Rahimi Azghadi
Secretary	Kenny Leong
Web Master	Kenny Leong
NT Subsection Chair	Mamoun Alazab
Membership Dev Officer	Ron Goodwin
Technical Seminars Coordinator	Bronson Phillipa
Education Activities Coordinator	Mohan Jacobs
Industry Liaison Officer	Joel Cox
WIE Rep	Melanie Olsen
YP Rep	Russell Davies
Student Branch Councillor	Mostafa Rahimi Azghadi
Power & Energy Society Chapter	
PES Chair	Graham Woods
PES Vice Chair	Ahmad Zahedi
Communication Society Chapter	
MTT-S/Com Sec Chair	Mohan Jacob
MTT-S/Com Sec Vice Chair	Janina Mazierska
Oceanic Engineering Society Australia Chapter	
OES Rep	Ron Goodwin



IEEE NA Exec 2020 AGM

- Section Highlights
 - Celebrated our 25th year as an IEEE section
 - Achieved award for best 2020 R10 small section for membership growth.
 - Launched our IEEE Backyard Inventions series (IBIS), drawing good attendance for content from within our region despite COVID restrictions.
 - Held more than 17 technical events including Distinguished Lecturer presentations
 - Held the annual IEEE Peter Arlett Night virtually with great success
 - Jointly held a Women in Engineering Breakfast with Engineers Australia for International Women's Day.
 - Held 6 executive section meetings joint with Chapter meetings and Affinity group meetings
- Major Events (International, National)
 - 10 March 2020 *IEEE NA WIE International Women's Day Breakfast Panel "attract, support, retain and celebrate women in engineering"*, cohosted with Engineers Australia. 37 Attendees.
 - 17 Sep 2020 – David Leitch "*Peter Arlett Lecture - The Economic Consequences of Technology Change in Electricity for North Queensland*" Technical Seminar. 30 Attendees
- Major Chapter Activities
 - PES Chapter Technical seminars: 6
 - MTT-S/Comms Chapter Technical seminars: 4
 - Local OES Chapter Technical seminars: 2



IEEE NA Exec 2020 Meeting 1

- Major Student and Affinity Group Activities
 - A variety of workshops and a jointly hosted International Women’s day event with Engineers Australia (breakfast panel)
 - Held 6 WIE & YP affinity group joint executive meetings
- Awards

Constituted by the Section:
IEEE Northern Australia section awarded three undergraduate students awards at University awards ceremonies:

 1. Townsville: 1st year Engineering Student with highest GPA, who is joining Electrical/ Computer Engineering UG program.
 2. Townsville: 4th year Electrical/ Computer Engineering Student for the best project work.
 3. Darwin: IEEE prize is awarded to a 3rd year Electrical Engineering Student with the highest GPA

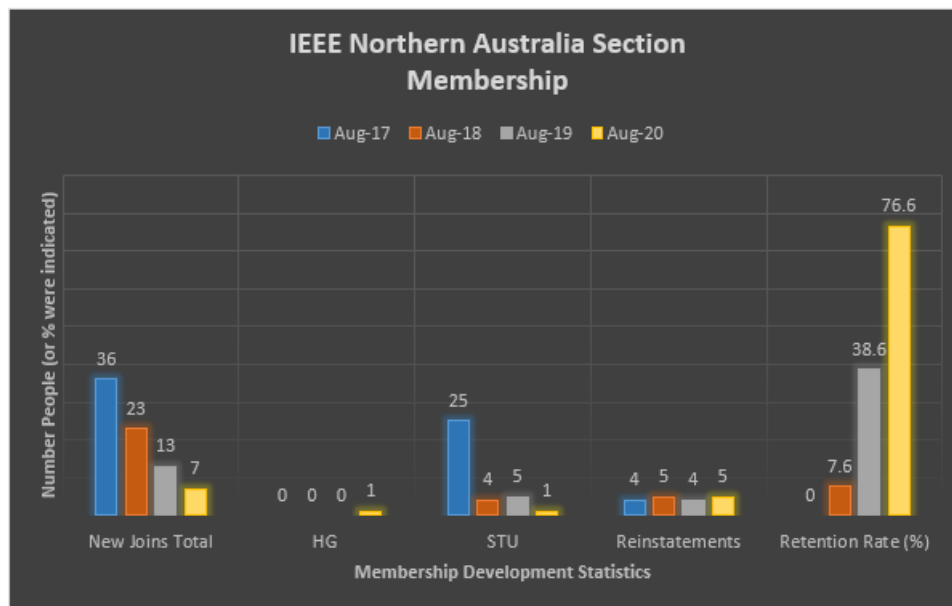
A.2 Financial Report – (Please follow the format given below)

- Summary – Annual General Meeting Treasurer’s Report
 - \$5,517.10 was paid (including 10% early reporting bonus thanks to Mostafa) as the IEEE NA membership rebate payment for ~200 members;
 - \$2,227.02 was paid for Section incentive reporting;
 - Minor interest credits were received over the year;
 - Over the reporting period, payments were made to support awards, meeting catering.
 - Final balances (as at 31st December 2020) were \$17,463.92 in the everyday account and \$21,325.35 in the term deposit account
- Any other financial activities
 - Was awarded \$1500 (USD) in R10 incentive funding based on activities reported in 2020.

PART B - ORGANIZATIONAL ACTIVITIES

B.1 Membership Development Activities

- Total number of active members in the past 3 years.
 - Membership ranges between 150 and 214 throughout the annual membership cycle
- Summary and evidence of work done to improve the value of membership, which leads to retention and growth of members
 - Awarded a certificate for R10 Small Section best membership growth in 2020
 - Northern Australia Membership development plan for 2021 awarded one of the top 10 plans within IEEE, and it was presented to the IEEE MD team.
 - Held a wide range of technical & networking events in different locations within the section
 - Our focus has been to deliver engaging content to section personnel amid COVID constraints, including boosting local content.
 - We have also focused on high profile events such the Peter Arlett lecture to attract new members as well as reached out into the community through judging robotics competitions and presenting to primary school students.



MD Trends over the last 4 years

B.2 Chapter Activities

- Total number of Chapters in the Section
 - Two (2) (MTT/Comm and PES). We are also part of an Australia wide OES Chapter
- Number of Chapters formed in the current year
 - Nil
- Number of active Chapters (Chapters who have reported required number of meetings during the year)
 - All Two (2) (MTT/Comm and PES) full chapters were active this year and we also reported activity locally as part of the Australia wide OES Chapter

- Summary of Chapter activities (Chapter wise with attachment table/information)

PES

1. 5 Jun 2020 – Donald McPhail “*Maximising Value from Distributed Energy Resources through Value Stacking*” Technical Seminar. 32 Attendees.
2. 11 Jun 2020 – A/Prof Keith Kikkert *Planning your Home Solar System with a Battery* Technical Seminar. 24 Attendees.
3. 9 Jul 2020 – Prof Saifur Rahman “*Role of the Smart Grid in Facilitating the Integration of Renewables*” 81 Attendees.
4. 16 Sep 2020 - DL Edward I. Ackerman of Photonic Systems “*Analog Photonic Systems: Features & Techniques to Optimise Performance*” Technical Seminar. 2 NA Attendees.
7 Sep 2020 – David Leitch “*Peter Arlett Lecture - The Economic Consequences of Technology Change in Electricity for North Queensland*” Technical Seminar. 30 Attendees.
5. 31 Oct 2020 – Ronnie Minhaz “*Transformer Design Workshop*” Technical Workshop. Attendees: 5 NA registrations
6. 2 Dec 2020 – Tim Daly AEMO “*Cyber Security for Smart Energy Systems*” Technical Seminar. Attendees: 2 NA

MTT/Comm

1. 27 Feb 2020 – A/Prof Mal Heron “*Communications in Bushfires*” Technical Seminar. 13 Attendees
2. 7 May 2020 IEEE NA Backyard Inventions Series. Dr. Graham Woods “*Dunny Dramas – the 12VDC Pump*” 13 Attendees.
3. 2 Jul 2020 – IEEE NA Backyard Inventions Series. Benjamin Halfpenny “*An Online Water Metering System, Or SBC’s for Intelligent Remote Presence*”. Technical briefing. 6 Attendees.

4. 29 Oct 2020 – Prof Atef Elsherbeni “*SAR and Temperature Rise in a Human Head due to EM Radiation for Frequencies up to 100 GHz*”. Technical Seminar. 2 NA Attendees.

OES

1. 24 Aug 2020 – Melanie Olsen “*Engineering Careers in Robotics at SCCC Primary School*”. Technical Briefing. 80 Attendees.
2. 9 Jul 2020 – Ronald Goodwin “*Green Turtle Nesting From an Engineering Perspective*” Technical Briefing. 23 Attendees.

B.3 Professional and Continuing Education Activities

Summary of continuing Educational activities including conferences, technical activities, training courses, and distinguished lecture programs with attachment table / information

1. 27 Feb 2020 – A/Prof Mal Heron “*Communications in Bushfires*” Technical Seminar. 13 Attendees
2. 10 March 2020 International Women’s Day Breakfast Panel “*Attract, support, retain and celebrate women in engineering*” Technical Panel cohosted with Engineers Australia. 37 Attendees.
3. 7 May 2020 IEEE NA Backyard Inventions Series. Dr. Graham Woods “*Dunny Dramas – the 12VDC Pump*” 13 Attendees.
4. 5 Jun 2020 – Donald McPhail “*Maximising Value from Distributed Energy Resources through Value Stacking*” Technical Seminar. 32 Attendees.
5. 11 Jun 2020 – A/Prof Keith Kikkert *Planning your Home Solar System with a Battery* Technical Seminar. 24 Attendees.
6. 2 Jul 2020 – IEEE NA Backyard Inventions Series. Benjamin Halfpenny “*An Online Water Metering System, Or SBC’s for Intelligent Remote Presence*”. Technical briefing. 6 Attendees.
7. 8 Jul 2020 – A/Prof Dr. Supavadee Aramvithat “*Reskill & Upskill for the Digital Transformed Workforce*”. Technical seminar. 25 Attendees.
8. 9 Jul 2020 – Ronald Goodwin “*Green Turtle Nesting From an Engineering Perspective*” Technical Briefing. 23 Attendees.
9. 9 Jul 2020 – Prof Saifur Rahman “*Role of the Smart Grid in Facilitating the Integration of Renewables*” 81 Attendees.
10. 16 Sep 2020 - DL Edward I. Ackerman of Photonic Systems “*Analog Photonic Systems: Features & Techniques to Optimise Performance*” Technical Seminar. 2 NA Attendees.
11. 24 Aug 2020 – Melanie Olsen “*Engineering Careers in Robotics at SCCC Primary School*”. Technical Briefing. 80 Attendees.
12. 17 Sep 2020 – David Leitch “*Peter Arlett Lecture - The Economic Consequences of Technology Change in Electricity for North Queensland*” Technical Seminar. 30 Attendees.
13. 24 Sep 2020 – Prof Lance Fung “*Impact of COVID-19 on Engineering Education in Australia*” Technical Seminar. NA Attendees: 2 (many more NSW attendees)
14. 29 Oct 2020 – Prof Atef Elsherbeni “*SAR and Temperature Rise in a Human Head due to EM Radiation for Frequencies up to 100 GHz*”. Technical Seminar. 3 NA Attendees.
15. 31 Oct 2020 – Ronnie Minhaz “*Transformer Design Workshop*” Technical Workshop. Attendees: 5 NA Attendees
16. 2 Dec 2020 – Cybersecurity for Smart Energy Systems by Tim Daly, AEMO (Victoria PES). Attendees: 32 NA attendees
17. 3 Dec 2020 – Natalie Stevens “*Space 2.0 – the Buccaneer Project*” Technical Seminar. Attendees: 17 attendees

B.4 Students Activities

- Total number of Student Branches in the Section
 - One (1) with Two new branches through SubSection
- Number of Student Branches formed in the current year
 - Nil, although 2 through SubSection

- Section level student activities (student congress, paper and other contests, awards etc)
 - Student branch held three (3) student branch workshops and an AGM through year.
- Number of active Student Branches (Student Branches who have reported required number of meetings during the year)
 - One(1) and Two new ones through Sub-section that need more assistance with reporting
- Summary of Student Branch activities (Student Branch wise with attachment table/information)
 - Running group study sessions and workshops regularly as a club at JCU, Townsville.
 - Feb 2020 *Student Branch Arduino Workshop*, Technical Workshop, 10 Attendees.
 - Mar 2020 *Student Branch Arduino Workshop*, Technical Workshop, 10 Attendees.
 - Aug 2020 *Student Branch Memorial BBQ* (two talented members of our student branch sadly passed away), 40 attendees.
 - 24 Sep 2020 Student Branch/YP presentation cohosted with IEEE NSW “*Impact of COVID-19 on Engineering Education in Australia*”, by Prof Lance Fung. NA Attendees: 2 (many more NSW attendees).
 - 11 Oct 2020 *IEEE NA Student Branch AGM*, 2021 student committee elected. Attendees: 8.
 - 31 Oct 2020 *Transformer Design Workshop* cohosted with IEEE NA Student Branch/YP. Attendees: 5 registrants as of 30 Oct 2020.

B.5 Affinity Group Activities

- Young Professional (YP)
 - Held six joint executive meetings through year.
 - 24 Aug 2020 – Melanie Olsen “Engineering Careers in Robotics at SCCC Primary School”. Technical Briefing. 80 Attendees.
 - 17 Sep 2020 – David Leitch “Peter Arlett Lecture - The Economic Consequences of Technology Change in Electricity for North Queensland” Technical Seminar. 30 Attendees.
- Women In Engineering (WIE)
 - Held six joint executive meetings through year.
 - 8 Jul 2020 – A/Prof Dr. Supavadee *Aramvithat* “*Reskill & Upskill for the Digital Transformed Workforce*”. Technical seminar. 25 Attendees.
 - 10 March 2020 International Women’s Day Breakfast Panel “Attract, support, retain and celebrate women in engineering” Technical Panel cohosted with Engineers Australia. 37 Attendees.
 - 24 Aug 2020 – Melanie Olsen “Engineering Careers in Robotics at SCCC Primary School”. Technical Briefing. 80 Attendees.
- Life Member (LM)
 - Currently don’t have enough members to form a LM affinity group.

B.6 Awards & Recognition Activities

- Awards constituted by the Section
 - IEEE Northern Australia section awards three undergraduate students awards at University awards ceremonies:
 1. Townsville: 1st year Engineering Student with highest GPA, who is joining Electrical/ Computer Engineering UG program.
 2. Townsville: 4th year Electrical/ Computer Engineering Student for the best project work.

3. Darwin: IEEE prize is awarded to a 3rd year Electrical Engineering Student with the highest GPA.
- Please list all Awards and Recognitions received by the Section, and members in the Section, from R 10 and IEEE HQ during the year
 - Awarded R10 award for best small section membership growth
 - Membership Development 2021 plan awarded in top 10 IEEE plans, presented plan to IEEE late 2020.
 - Awarded \$1500 (USD) in R10 incentive funding based on activities reported in 2020.

B.7 Communication Activities (Newsletter, Home Page, E-mail etc.)

- Newsletter (name and number of issues in the year)
 - Nil
- Home Page of the Section (give the URL and how often it is updated)
 - <https://r10.ieee.org/naus/>
 - Website was revamped this year and is typically updated on an ad-hoc basis approximately 10 times a year.
 - https://www.youtube.com/channel/UCmifeUSFgpY6kBXTvDzJ8_Q
 - Regular youtube video recordings of seminars were uploaded this year
- Other means of contacts with Section members including social media
 - Member contact is based on ad-hoc email to the member lists with information on upcoming events. NEWS & EVENTS are also typically reported on the section Web site.
 - Collabratec was setup for storing Exec content, and the Section Chair also joined the R10 Collabratec site to keep up to date.

B.8 Industry Relations

- Membership growth and retention
 - Have had good growth in Industry membership over recent years. The IEEE Backyard Invention Series gained a lot of local support which assisted boosting numbers. High profile events including the Peter Arlett lecture were particularly focused at industry members.
- Activities for/with industrial members
 - 2020 IEEE Peter Arlett Lecture was a joint event with PES. This talk was held virtually and very well attended by industry professionals and IEEE members.
 - A variety of industry focused technical seminars were held virtually throughout the reporting period.

B.9 Humanitarian Technology Activities

- Humanitarian Technology related activities supported by the Section including collaboration with other OUs.
 - Nil
- SIGHT Activities
 - Nil

B.10 Community Activities

- IEEE Social activities (Family day, IEEE day, Engineers Week)”

- 19 Aug 2020 – 2 x IEEE NA Exec members were Judges for a Primary School Regional Smart Lego Competition for Science Week. Attendees: 100 (estimated)
- 10 March 2020 International Women’s Day Breakfast Panel “*Attract, support, retain and celebrate women in engineering*” Technical Panel cohosted with Engineers Australia. 37 Attendees.
- 8 Jul 2020 – A/Prof Dr. Supavadee Aramvithat “*Reskill & Upskill for the Digital Transformed Workforce*”. Technical seminar. 25 Attendees.
- IEEE NA also wrote a letter of support for a local initiative to establish a museum promoting electrical power technology at Hughenden.

PART C - OTHERS

C.1 Special Events

- Please briefly describe the importance of special events and the outcomes achieved
 - The communications in Bushfires event aligned with the end of Australia’s bushfire disaster, providing local community insight into some of the communications issues faced in bushfire events.
 - The Peter Arlett event is held in honour of Peter Arlett from the NA Region, and it is always a highlight from the PES society in our region.
 - The IEEE Backyard Invention Series (IBIS) initiative really kickstarted our section mid-COVID leading to an increase in activity in 2020 when compared to previous years. Local IEEE members presented their inventions to our section which boosted morale.



An Ibis – Australia’s “bin chicken”

- Funding secured from the IEEE and external sources including sponsorships
 - 2020 Yearly IEEE rebate.
 - In-Kind support from Engineers Australia to support our joint International Women’s Day Breakfast

C.2 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed
 - IEEE has a signed MOU with Engineers Australia
- Details of joint activities
 - Many of our virtual events were advertised across Australia.
 - 10 March 2020 International Women’s Day Breakfast Panel “*Attract, support, retain and celebrate women in engineering*” Technical Panel cohosted with Engineers Australia. 37 Attendees.
 - 3 Dec 2020 – Natalie Stevens “Space 2.0 – the Buccaneer Project” Technical Seminar. Attendees: 17 attendees, jointly held with Defence Science Technology Group and the Australian Institute of Marine Science, with support from James Cook University.
- Benefit to IEEE members (for example discounts, access to technical information etc.)

- Subsidised or free cost to IEEE members.
- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)
 - Great increase in exposure of IEEE within our region and exposure of our members to new technology areas outside of those typically promoted within IEEE Northern Australia (e.g. space and COVID impacts).

C3. Collaboration with other IEEE Sections

- Support extended to neighboring Sections
 - Supported events to boost the newly formed IEEE Northern Territory sub-section.
 - Shared hosted events with other sections and chapters nationally through virtual presentation formats.
 - As part of the Australia Council our section contributes to Australia wide initiatives such as the student branch competitions and also consultation on important matters relevant to Australia.
- Joint activities with any other Section
 - The Northern Australia section covers a huge geographical area. The nearest section is approximately 1500km from our sections geographic centre. Joint activities typically involve coordinating visiting lecturers throughout the year and cohosting virtual events such as:
 - 24 Sep 2020 – Prof Lance Fung “*Impact of COVID-19 on Engineering Education in Australia*” Technical Seminar, cohosted with NSW section.
 - A variety of joint section hosted PES and MTT/COMM presentations

C.4 Support extended to Sub-sections & Society Chapters within the Section

- Support extended for organizing technical, educational and professional activities
 - In a small section, the activities of the section and chapters are very closely linked with section executive committee members often also having chapter official positions. In this way the support from section to chapters is continuous throughout the year with near complete removal of barriers in the organizational structure.
- Joint activities for membership development
 - Key membership development activities were focused on joint technical talks and networking events often involving industry partners such as Energy Queensland and the Australian Institute of Marine Science. For details see section B.2 above.
- Support extended for the formation of a Sub-section or transition of a Sub-section into a full Section
 - Supported the new Northern Territory sub-section in Darwin this year. Provided advice and substantial financial support to the sub-section for events and awards, as well as support for hosting future international IEEE events.

C.5 Best Practices of your Section (which you would like to share with other Sections for the benefits of members)

The section has focused on a small number of events to enhance the IEEE’s profile within the local professional community. This year we provided 2 judges for a regional robotics lego competition, gave talks to primary school students on engineering careers and established a new local content focused series called “IBIS - IEEE Backyard Inventions Series”, named after Australia’s iconic Ibis bird – the bin chicken.



Photos: Robotics Competition Judging and example of an IBIS talk by previous NA Section Chair Dr. Graham Woods

Executive committee members were encouraged to assist with the planning and execution of key events throughout the year. This was very successful not only leading to outstanding events but also empowering members within the Section. This has led to increased interest from members, particularly young members to take on new executive roles within the Section.

An activities calendar was developed at the start of the year to set dates and start planning for key events in the year. This planning was useful to ensure funding was available to support upcoming events and new initiatives. COVID forced our section to switch to virtual events which led to increased numbers and more support across Australia. It also greatly improved the morale of our small section which was isolated due to mostly working-from-home national arrangements.

The WIE affinity groups were more active this year than last year, resulting in a new WIE exec rep joining the NA Section for 2021. It is hoped this effort will continue to build momentum and gain more stand-alone support within the section as affinity groups in their own right. The Exec will continue to encourage affinity group activities to explore new virtual mechanisms of increasing involvement in these changed COVID times, as well as enhancing collaboration across industry and the wider community.

A strategic plan for the section was developed in 2019 which helped define what are the main aims of the section and give executive members a resource to assess how best to focus resources in future years. This was reviewed during the year with a 2021 membership development plan established to really focus efforts into industry in the coming year.

C.6 Problems anticipated and suggestions for solutions, if any

The student branch and YP Affinity group did hold some activities this year but was not as active as in previous years. Two key student exec members tragically passed away which greatly impacted the local student branch. The executive needs to continue to invite and encourage the student branch and YP executive committee members to attend Section executive committee meetings and plan events for the student branch. In 2021, this has been programmed as a focus with joint events in robotics and other student interest areas with the NA Section.

PART D - GOALS AND PLANS

D.1 Continuation of project/activity in progress and their implementation plans

The NA Section website was completed as well as commencing regularly saving video copies of presentations and establishing an archive for important documentation such as the section's history, photographic records, strategic plan, etc on both the website and collabratec.

D.2 Goals and Future Plans

Establish Section Volunteer Awards for;

- IEEE Northern Australia Outstanding Volunteer
- IEEE Northern Australia Outstanding Young Professional
- IEEE Northern Australia Outstanding Women In Engineering Volunteer

➤ IEEE Northern Australia Outstanding Student Volunteer

Details of the awards and nomination forms are to be added to the Website. Nominations will in general close in August of each year with award winners presented with a certificate at the AGM in November.

In 2021 we will continue our IEEE Backyard Invention Series whilst also establishing a robotics competition within the community to promote IEEE within our regional, small section.

D.3 Any innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals.

Investigate opportunities for hands-on workshops catering to the interests and needs of local members. These could be non-technical in nature and may include a networking/ social focus as well.

Hold an Industry meets Student members event possibly with a Mock Job Interview element included. The event might also incorporate a YP and /or WIE affinity group focus as well.

Engage in regional events involving problem solving, engineering & innovation initiatives to broaden our member-base. This includes joint events with other engineering groups (especially affinity groups) and wider community initiatives such as science week.

Incorporate social media and more frequent website promotion into our advertising regime, to increase the audience at our activities and our presence in the community.

The 2020 successful launch of our IBIS (IEEE Backyard Invention Series) program will be continued into 2021 to boost regional engineering content profile amongst our members and provide a platform to showcase local innovation. This virtual series eliminates impacts from COVID-19, and this year we hope to make it a competition with a best IBIS award presented at the end of the year.

Given the interest in robotics within our student and industry membership base, we will also be working to establish a community engaged robotics competition, including encouraging friendly competition between our Cairns and Townsville groups.

D.4 Business Plan for Sustainable Growth and Financial Stability.

The Section is fortunate to have a stable organizational committee with a good mix of members from academic and industry backgrounds that understand the area and member needs. The executive committee includes representation from many of the major regional cities within the section including Cairns, Townsville and Darwin to encourage activities in the various regions. The executive members are also generally highly motivated and willing to assist and support the Section as required.

By focusing on a small number of high profile events and including networking opportunities, the Section aims to remain relevant to the needs of local members and promote growth within the wider professional community.

This year, a Membership Development plan was also developed to complement our 2019 Strategic Plan to assist our Section in maintaining a cohesive vision moving into the future. It enables the section to focus resources into activities that the section has determined are its core business and are financially sustainable. Regular review of the Section's financial status was conducted to ensure sufficient funding was available for planned events and for future contingencies. COVID-19 restrictions built a higher budget than anticipated to support 2021 which we are planning to use to create a great membership drive in 2021 through boosting our student and industry support networks.