

Worksession Agenda Item: I.

DATE: April 22, 2015

SUBJECT: 2015-25 Master Planning Cycle Update

ACTION RECOMMENDED: Information

BACKGROUND INFORMATION: Since the summer of 2014, members of the THEC staff have undertaken a range of activities to prepare for the 2015-2025 long-range higher education planning cycle. These include:

- Collaborative development of the Tennessee Economic Success Metrics tool, which shows employment and earnings outcomes for recent college graduates by institution, degree program, and degree level;
- Collaborative development of the EduTrendsTN.com web site, which shows the above outcomes for postsecondary completers one-, three, and five-years following entry into the Tennessee labor force;
- Development of a Simulation Tool for modeling changes in postsecondary diploma, certificate, and undergraduate degree outputs in light of simulated changes in in the K-12 and postsecondary productivity and efficiency;
- Individual interviews and webinars conducted with members of the Tennessee Higher Education Master Planning Committee;
- An updated Supply-Demand study for graduates of Tennessee postsecondary education; and
- Contracting with the National Center for Higher Education Management Systems (NCHEMS) for technical assistance in developing the 2015-2025 *Plan*.

The upcoming planning cycle has been extended from the typical five years to ten because of two factors: 1) it coincides with the planning horizon of the Drive to 55; and 2) overarching planning assumptions and environments are not predicted to change appreciably. A mid-cycle review of planning objectives and progress-to-date is planned.

The Commission has three primary mechanisms at its disposal to establish policy, planning, and funding priorities for the decade 2015-2025:

- Tennessee Higher Education Master Planning Committee (David L Wright, lead staff)
- Funding Formula Review Committee (Russ Deaton, Crystal Collins, and Steven Gentile, lead staff)
- Quality Assurance Funding Committee (Betty Dandridge-Johnson, lead staff)

These Committees contain representation from the three grand divisions of the state; postsecondary campus, system, and sector leaders; business and community leaders; the Governor's Office; the General Assembly; the Department of Education; the Department of Labor & Workforce Development; and the Department of Economic & Community Development.

The Work Session will contain updates from each Committee, with resulting questions from and discussion by members of the Tennessee Higher Education Commission.

Perspective on Tennessee's Policy and Planning Issues for the Decade 2015-2025

submitted April 15, 2015

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The overarching goal for Tennessee is already well-established in the Drive to 55 – that 55 percent of Tennesseans ages 25-64 will have a postsecondary degree or credential of value by 2025. With the major goal already in place, the master planning effort for the next decade needs to address the following topics:

- Other State goals deserving of attention
- Adding detail to D55
- Determining additional capacity needed to meet goals
- A financing strategy – how to pay for goal attainment

A brief elaboration of each of these topics is provided below.

1. Other State Goals

While Drive to 55 is the centerpiece goal, there are other goals that should be given consideration, specifically:

- a. Innovation/contributions to *expansion and diversification of the state's economy*. Provision is made in the funding model to reward Universities for research funding. The questions for consideration in the master planning process are:
 - Whether or not goals for research funding should be established – either in total or in specific fields.
 - Whether goals should be established for technology transfer, economic growth that can be traced to university research activity. There is no real consensus on how to articulate this particular type of goal or on which metrics to use in monitoring performance. Among the metrics used elsewhere are:
 - Licensure revenues
 - Number of start-up companies (or employment in such companies) derived from research activity
- b. *Workforce development responsiveness to employer needs*. This is discussed in more depth under the D55 Detail label.



2. *Adding Detail to the Drive to 55*

There are numerous dimensions/questions to be addressed under this topic, among them:

- a. *Developing targets by level of degrees/awards.* Of the additional degrees/certificates that must be produced to reach the 55 percent goal, what proportion should be
 - Baccalaureate degrees
 - Associate degrees
 - Certificates with workplace value

Nested within this question are questions about workforce needs, not only level but key areas – STEM, health professions, advanced manufacturing/skilled trades and other fields (as identified by the State’s Departments of Economic & Community Development and Labor & Workforce Development) and whether and how to attach incentives to credential production and/or placement in these areas.

- b. *Developing targets for improved cohort-based completion rates.*
- c. *Identifying underserved populations* that must be served if the D55 goal is to be attained. This may result in sub-goals being established in order to:
 - Close the racial attainment gap
 - Close the economic attainment gap
 - Close the geographic gaps – in student access and completion not education attainment (student mobility after college and differences in economic opportunity make it difficult to close attainment gaps by county/region, but it’s worth a discussion)
 - Increase the number of degrees/certificates awarded to adults
 - Leverage the return on investment represented by veterans of military service – a population of sufficient number for Tennessee to build a strategy around.

The objective should be a strategy that combines achieving success with different subpopulations and producing degrees of different types/levels. For example, the strategy for serving additional numbers of adults should recognize that the large majority of such students will seek high-value certificates, more so than AAs or BAs.

3. *Assessment of Required Capacity – Strategy for Delivering Services*

The strategies for reaching established goals will require both that a) a higher proportion of enrolled students succeed in completing academic programs, and b) additional students (as identified above) be served successfully. Increased capacity may be required with regard to each category. Increased completion rates may require provision of additional student support services or data analytics capacity that allows early intervention and provision of support services to students at risk of failure/dropping out.

Accommodating additional students may require added capacity of various types:

- a) Additional programmatic capacity to serve more adults in the TCATs

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- b) Additional sites in underserved regions of the state
 - c) Expansion of physical capacity at existing sites and centers
 - d) Creation of entirely new delivery models
 - o A centralized capacity for PLA (Prior Learning Assessment)
 - o Expanded online or new competency-based delivery models (in addition to WGU TN)

The determination in all of these areas needs to be rationalized as responsive to conclusions about the numbers and characteristics of new students to be served.

As part of the calculus regarding needed capacity, informed estimates will need to be made about the numbers of additional degrees produced/students served that will be contributed by non-public institutions.

The master plan need not address capacity issues in detail, but it should describe the array of steps needed for goal attainment – the extent to which Tennessee will rely on the individual broad strategies to reach the overarching goal.

4. Paying for Goal Attainment

At the end of the day, the stated goals can be reached only if a way can be found to fiscally support their attainment. As part of the master planning activity, it is suggested that some effort be devoted to investigating different scenarios regarding appropriations to institutions, tuition, student financial aid, improvements in institutional productivity, and reliance on alternative providers that:

- a) Support goal attainment
- b) Provide adequate funding to institutions
- c) Bring the necessary additional students into the system
- d) Maintain affordability, for students and the State

The objective is to create scenarios that provide broad cost estimates based on a reasonable set of assumptions. As part of the calculation, some estimate of costs associated with goals other than D55 should be made.

5. Supporting requirements

- a) Underpinning all the above must be a foundation of trusted, reliable data. Here, Tennessee has an advantage over many states, in that it has a longitudinal student unit record data system that provides the analytic capacity to shed light on the policy issues surfaced above. Further, the working relationships between the coordinating board, the two public governing boards, and the non-public sectors are typically collegial and productive.
- b) Informing campus, system, and state leaders of progress toward goal attainment must be an ongoing program of formative (in-process) and summative (at the end of the planning cycle) monitoring of D55 goals and processes. This need not be

thought of as an accountability mechanism in the same sense as the Outcomes-Based Funding Formula and the long-standing Quality Assurance (formerly Performance Funding) program, which tie funding directly to performance. Yet, there is still a separate need for an online gathering place for information on D55 goal attainment that stands apart from all the initiatives and activities and asks, “How are we doing as a State? As a region? As a system? As an institution?”

This could take the form of an ongoing Progress Report that is updated annually or biannually, depending on how frequently the data are refreshed. There are helpful antecedents for this kind of tool in the form of secondary and postsecondary dashboards on the Tennessee Longitudinal Data System (TLDS) website; the Tennessee Economic Success Measures web tool (<http://esm.collegemeasures.org/esm/tennessee/>); and the EduTrendsTN.com website developed in concert with College Measures and MatrixKnowledge.

APPENDIX A

Methodology for Undergraduate Award Projections and Credentials Gap Estimation

This appendix describes the approaches employed to project the production of college credentials and calculate the gap between the *Needed Growth* in award production to meet the Drive to 55 goal, and the projected *Natural Growth* in undergraduate credentials.

Section A1 provides the background and the working assumptions of the methodology. Section A2 describes how award projections were calculated. Section A3 explains the steps to calculate the gaps in award production. Section A4 provides tables and figures for the output described in sections A1-A3.

Section A1. Background and Working Assumptions.

The Drive to 55 campaign intends to raise the proportion of the state's working-age population (age 25-64) with college credentials to 55 percent by 2025. THEC's 2015-2025 Master Plan outlines the roadmap toward this goal. The working assumptions outlined below provide for the use of the selected methodology.

The first assumption is that the focus should be on the undergraduate credentials, that is, on pre-baccalaureate certificates, associate's degrees, and bachelor's degrees. The rationale for this decision is that graduate degrees require a prior bachelor's degree and do not affect conventional estimates of education attainment as defined for the Drive to 55 purposes.

A related working assumption is that college *completers* should be counted, as opposed to postsecondary *awards* produced by Tennessee institutions. By focusing on award recipients and counting only the highest level of attainment, this approach avoids double-counting individuals who have received more than one credential. To achieve this goal, duplicate observations of students were removed prior to making projections.

The third assumption accounts for various factors affecting the production of college credentials. The choice of predictors of postsecondary award production is driven by prior research, theory, and data availability. Undergraduate award projections and award production gap estimates are also dependent on secondary data projecting high school graduates and statewide population growth. Data sources and their applications are explained below.

Finally, historical data on undergraduate degree completers over multiple years and across all institutional sectors are used to create reliable projections for the next eleven years. In addition, overall projections by award type lend themselves to projections by institutional sector. The latter should serve as a basis for estimating institutional shares in projected undergraduate award production.

Section A2. Undergraduate Award Projections: 2015-2025.

Credential production projections were calculated by award level (pre-baccalaureate certificates, associate's, and bachelor's degrees) and institutional sector. This section describes the methods and data used for these award projections. Overall and sector-specific projections, as well as estimated institutional shares, are presented in Section A4.

Undergraduate award projections require several steps. First, historical data were collected across all institutional sectors from 2006 to 2014. Availability of reliable data for all institutional sectors determined the time period. The institutional sectors include Tennessee public universities; community colleges; Tennessee Colleges of Applied Technology (TCATs); private not-for-profit, for-profit, and out-of-state institutions reporting to THEC's Division of Postsecondary Authorization (DPSA); and private not-for-profit institutions, including TICUA member institutions

and private schools operating in Tennessee not reported to DPSA. Table 1 in Section A4 depicts the historical degree counts used in the projections.¹

Multivariate linear regression was used as the primary method to project postsecondary awards over the next ten years. The key advantage of this method is its ability to predict future values of the outcome variables (number of credential recipients) based on a combination of independent variables (the predictors listed below) used in the model. Another advantage of this approach is that it allows for by-sector estimates to precisely match the overall estimates. This characteristic of the linear model is important due to the need to project award production by credential and sector and keep these predictions within the constraints of the overall projections for Tennessee higher education.

The independent variables (predictors) used in the model include: the total undergraduate enrollment in Tennessee institutions (Source: IPEDS), number of high school graduates (Source: WICHE ²), college-going rate (Source: THEC SIS), and statewide unemployment rate (Source: Bureau of Labor Statistics). To calculate the future values of these predictors (in 2015-2025), the following decisions were made: (a) predict future undergraduate enrollment in a separate model, (b) keep the college-going rate at the last available value, (c) use the ten-year average for the unemployment rate, and (d) use high school graduates projections estimated by WICHE.

Postsecondary enrollment was estimated using a time-series model³, based on the historical data from 1997 through 2013, and using five predictors: number of high school graduates, college-going rate, unemployment rate, inflation-adjusted personal per capita income, and number of Tennessee residents aged 25-64. The data sources are as above. Data on per capita income were collected from the U.S. Bureau of Economic Analysis, and the last available value was used for the

¹ Although award duplication was eliminated for all public sectors (highest award was selected for each individual), some small degree of award duplication could be present in data on private institutions.

² Western Interstate Commission for Higher Education (WICHE). www.wiche.edu/pub/knocking-8th-and-supplements

³ Autoregressive Integrated Moving Average (ARIMA) model was used to predict enrollment.

period after 2013. The working-age population includes both historical data and data projected by the University of Tennessee's Center for Business and Economic Research (CBER).

Award projections (*natural growth* in credential production) were estimated by award type (Figure 1 shows both historical data and projections), by award and institutional sector (Figures 2, 3, and 4), and by sector with all awards combined (Figure 5). As explained above, projections by award and sector add up to match the overall projections.

Finally, based on each institution's share of credentials in its sector, expectations of institutional contributions to each sector's projected award production were estimated (Figures 6, 7, 8, and 9). Historical shares for each institution were calculated for the period 2006-2014, and were then applied to the respective sector's projections. The assumption is that within-sector institutional shares will remain stable over the next eleven years.

These award projections serve as a foundation for estimating the gap between the *Natural Growth* and the *Needed Growth* to meet the Drive to 55 goal.

Section A3. Estimating the Gap in Credential Production.

Estimating the gap in award production is a multistep process, based on data from various sources and several key assumptions.

To estimate the gap, two factors must be taken into account: a) the number of credentialed working-age individuals at the starting and finishing points of the projection period and b) the natural growth in award production.

To calculate the number of credentialed individuals needed to meet the Drive to 55 goal, one must first project the number of 25-64 years olds who will live in Tennessee in 2025. These data are available from CBER's population projections. Based on these projections, Tennessee will require **1,978,283** residents with a postsecondary certificate, Associate's degree, or Bachelor's degree to boast 55 percent of working age adults with postsecondary credentials in 2025.

The gap estimation relies on the 2013 American Community Survey (ACS), which provides data on educational attainment. The ACS does not include certificate holders; thus, based on the findings of a CBER's study⁴, we assume that four percent Tennessean's hold a certificate from a postsecondary institution. Tennessee's educational attainment (certificates or higher) in 2013, therefore, was 37.1 percent, which translates into **1,268,853 individuals** (Table 2).

To use 2013 as a starting point, it is necessary to include only Tennesseans who were 54 or younger in that year. The rationale for this is that this group will not age out of the workforce before 2025, and will be included in educational attainment estimates in 2025. Applying the same finding that four percent of residents will hold a postsecondary certificate, and adding this number to the ACS-estimated number of people with at least an associate's degree totals **1,053,969** credentialed Tennesseans who will not age out of the workforce by 2025.

The gap estimation also requires assumptions about interstate migration by educational attainment and natural mortality. Based on prior findings⁵, we assume that Tennessee has a positive net migration at every level of educational attainment, and therefore, the net migration of credentialed individuals is assumed to be zero. In other words, it was conservatively assumed that over the next eleven years, the proportion of residents with college credentials will remain unchanged. For the purposes of these estimations, due to data limitation, mortality was also assumed to be zero.

The difference between the number of credentialed individuals in 2025 and credentialed individuals below the age of 54 in 2013 minus the number of graduates in 2014 (69,817 awards) gives the overall number of credentials needed to meet the Drive to 55 goal. This number is estimated to be 854,498 awards, which translates into 77,682 credentials needed annually between

⁴ Carruthers, C. K., & Fox, W. F. (2013). *The 2011 stock of postsecondary certificate holders in Tennessee*. The University of Tennessee, Knoxville, Center for Business and Economic Research.

⁵ THEC. (2013, 2014, 2015). *Profiles and Trends in Tennessee Higher Education*. Nashville, TN: Author.

2015 and 2025 (Table 3). It should be noted that this number includes both the *Natural Growth* over the next 11 years and the gap between the *Natural Growth* and the *Needed Growth*.

Table 4 presents two main gaps: (1) The gap between the *Needed Growth* and the projected *Natural Growth* in award production for the period from 2015 to 2025 and (2) The gap between the *Needed Growth* and the award production at the 2014 level. The latter assumes that the natural annual growth will be equal to zero and each year Tennessee will produce awards at the level of 2014 (69,817 credentials). Based on the more realistic first gap, it was estimated that Tennessee needs to produce 59,820 additional degrees—that is, above the *Natural Growth* trajectory—to meet the Drive to 55 goals by 2025. Figure 10 depicts the same gaps visually.

Section A4. Figures and Tables.

Table 1. Historical Data Used for Award Projections⁶

sector	degree	2006	2007	2008	2009	2010	2011	2012	2013	2014
Public universities: TBR	Associate	153	160	186	175	170	232	261	323	320
Public universities: TBR	Bachelor	10,652	10,993	11,090	11,674	11,515	12,137	12,472	13,234	13,178
Public universities: UT	Bachelor	5,613	5,556	5,885	6,362	6,396	6,616	7,088	7,177	7,225
Community colleges	Associate	4,816	4,821	4,674	4,775	5,352	6,180	7,418	8,461	8,880
Community colleges	Certificates	1,025	935	986	1,020	1,400	1,643	3,253	2,457	2,791
TCATs	Certificates / diplomas	4,653	5,385	5,284	5,217	6,469	7,483	6,596	6,395	6,428
Private not-for-profit	Associate	667	536	507	453	489	534	570	646	666
Private not-for-profit	Bachelor	9,352	9,768	10,032	10,128	10,475	10,767	11,136	11,686	11,906
Private not-for-profit	Certificates	63	50	56	62	58	66	50	77	75
DPSA schools	Associate	NA	NA	2,479	2,761	2,841	3,930	4,280	3,275	2,840
DPSA schools	Bachelor	NA	NA	585	1,412	1,752	1,812	2,130	2,128	1,454
DPSA schools	Certificates / diplomas	NA	NA	18,947	15,116	16,004	15,611	15,045	13,836	14,054

⁶ The table presents counts of completers by the highest award level for public institutions and counts of awards for private institutions.

Figure 1. Award Production by Award Level: Historical Data and Projections

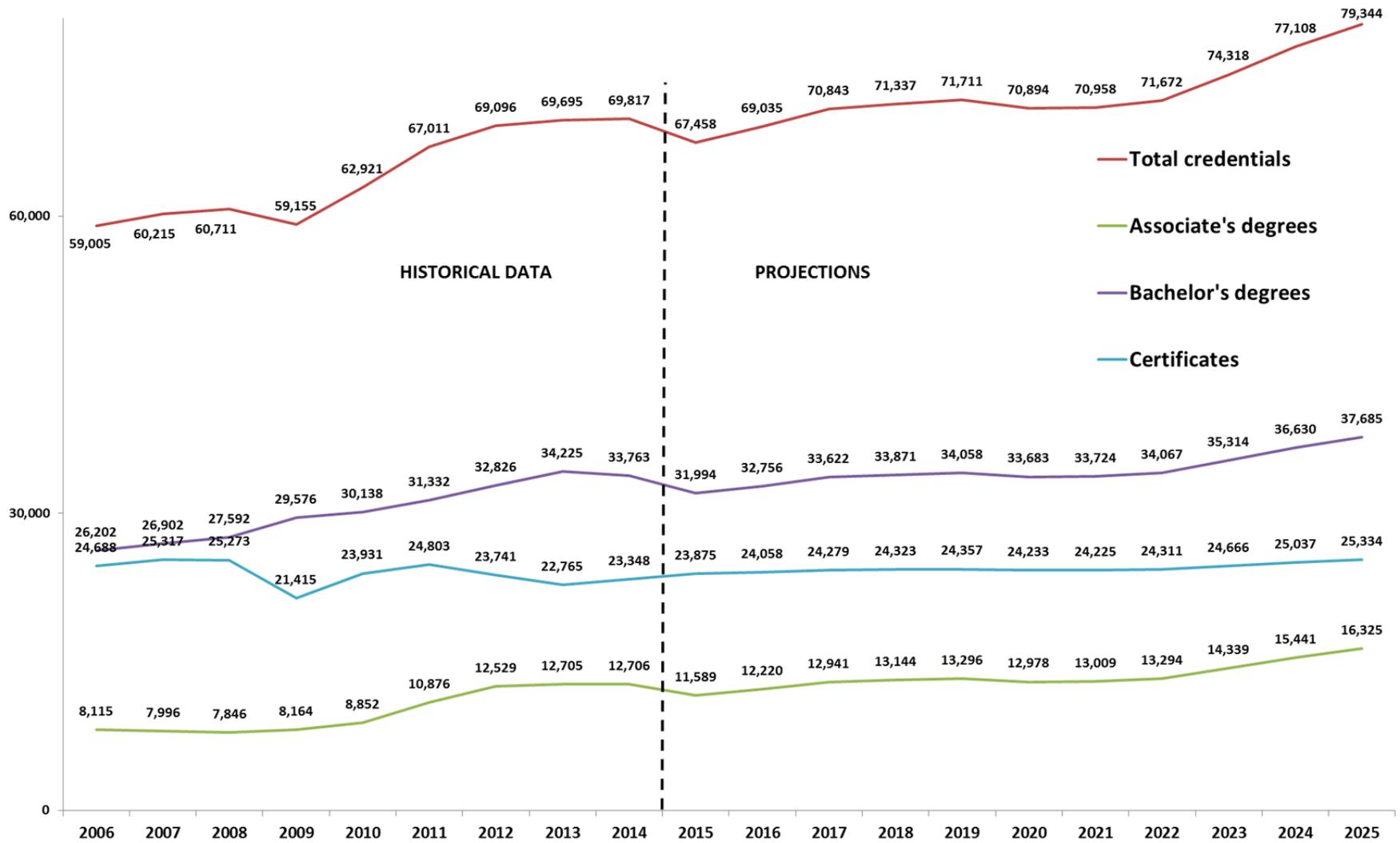


Figure 2. Bachelor's Degree Production by Sector

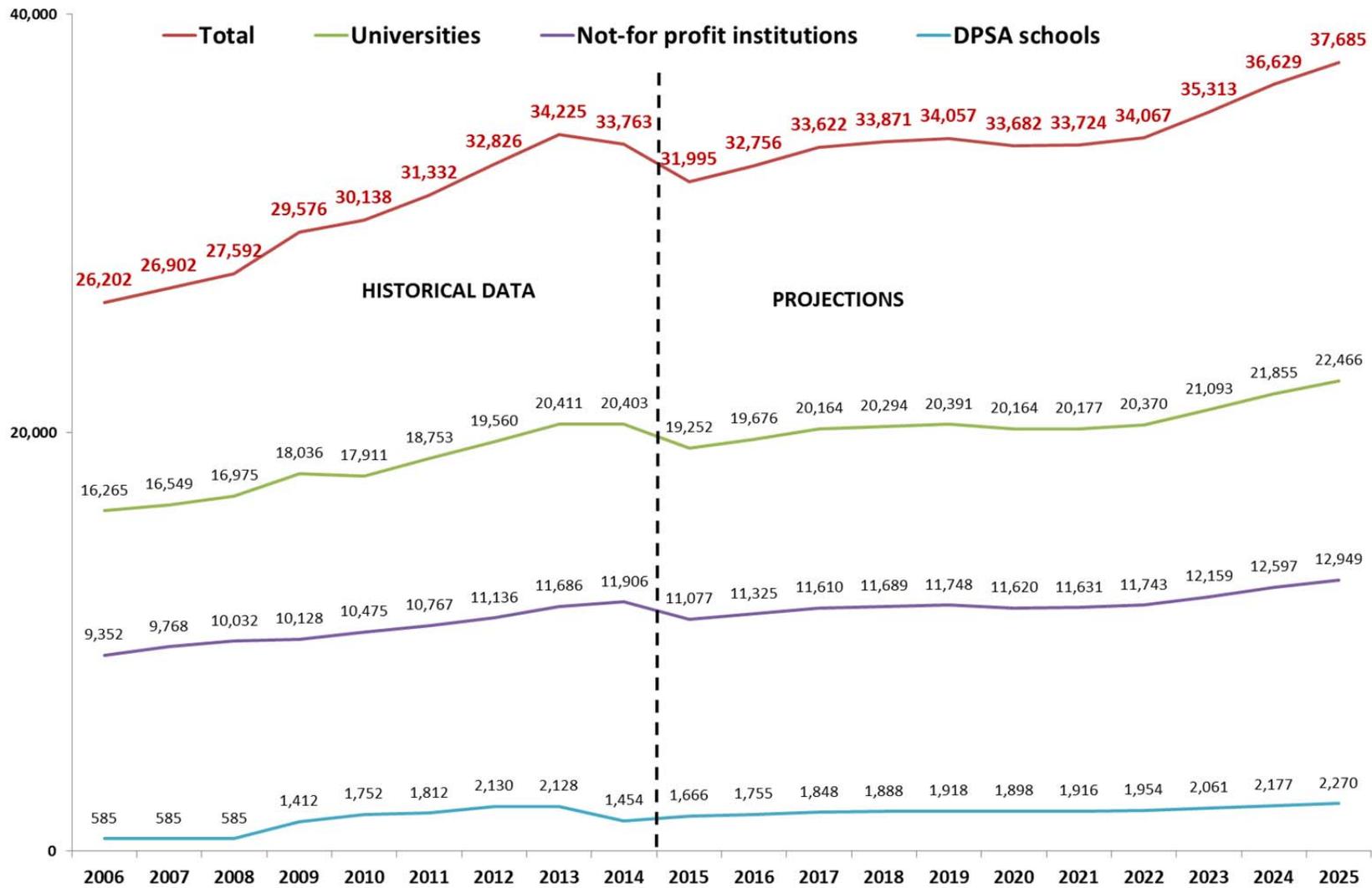


Figure 3. Associate's Degree Production by Sector

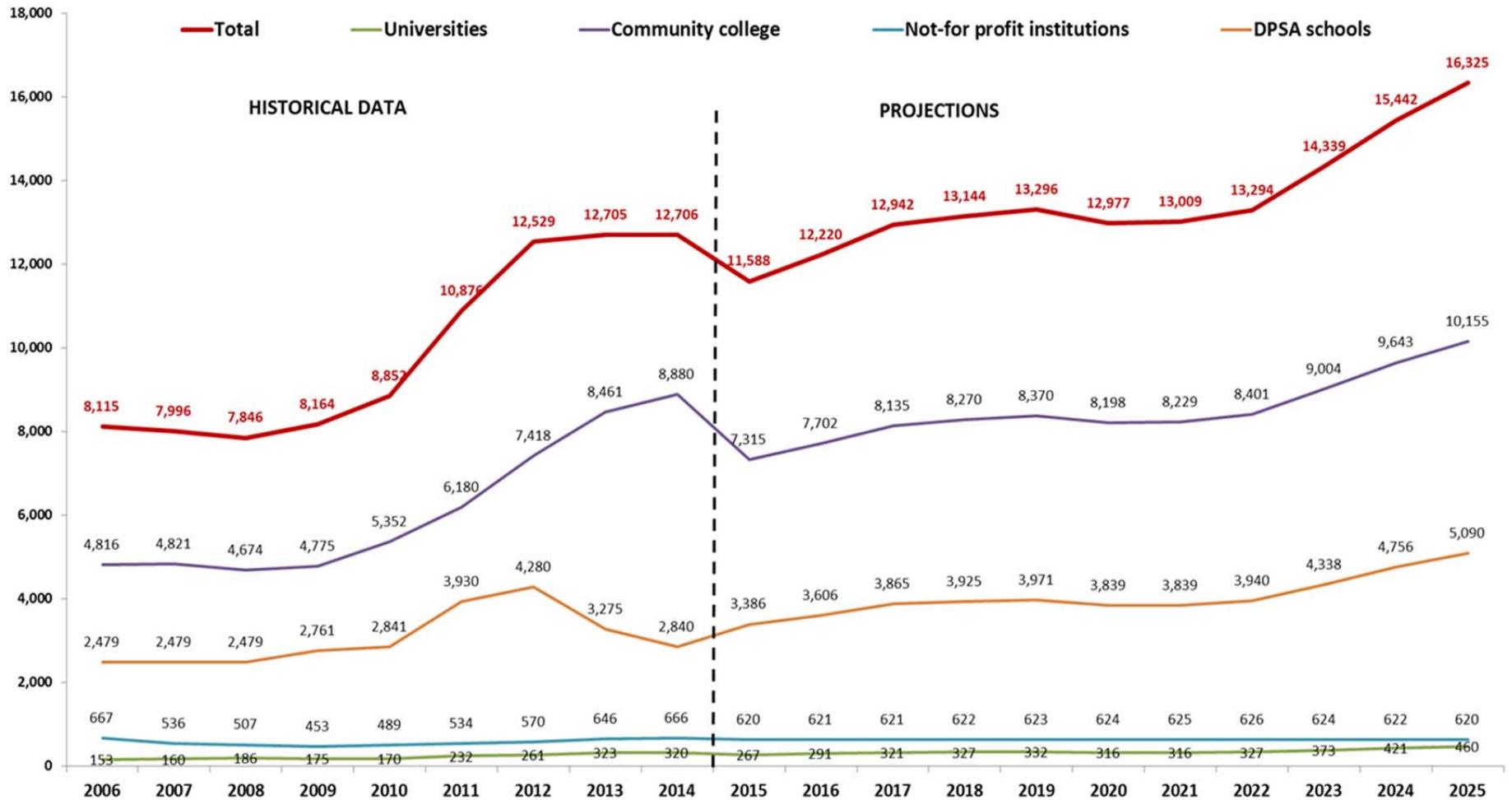


Figure 4. Certificate Production by Sector

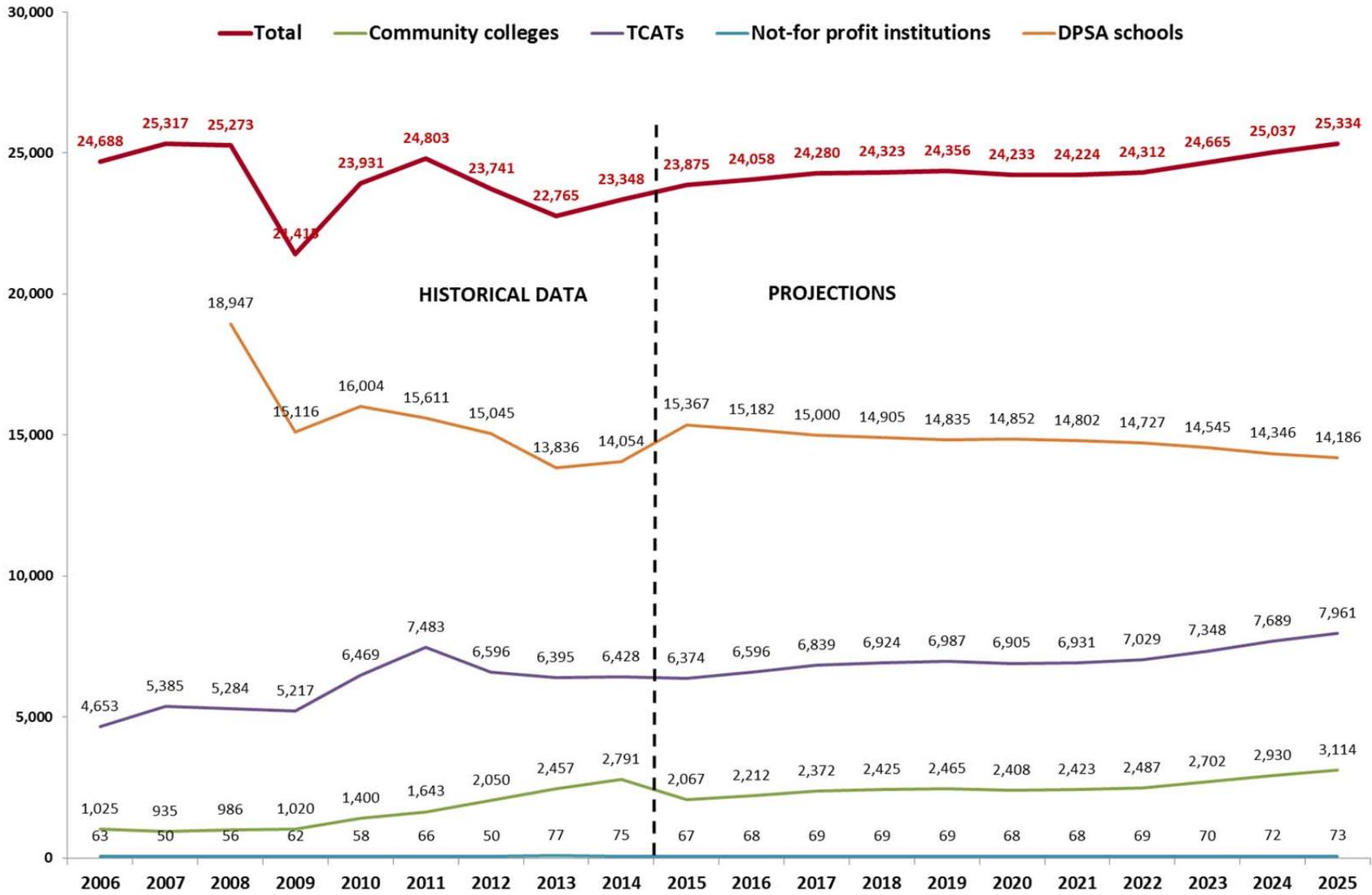


Figure 5. Total Award Production by Sector

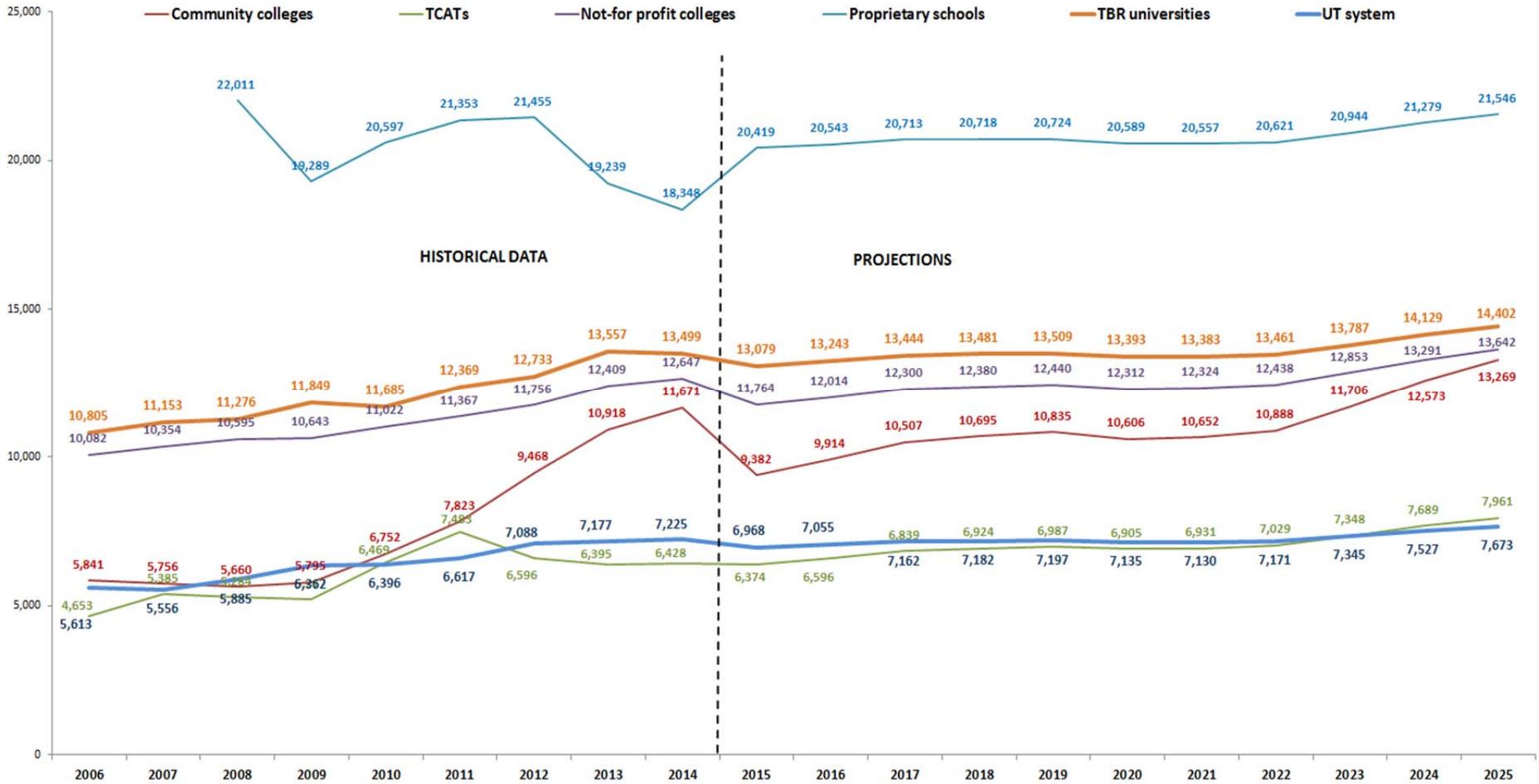


Figure 6. Award Production Projections: Public Universities

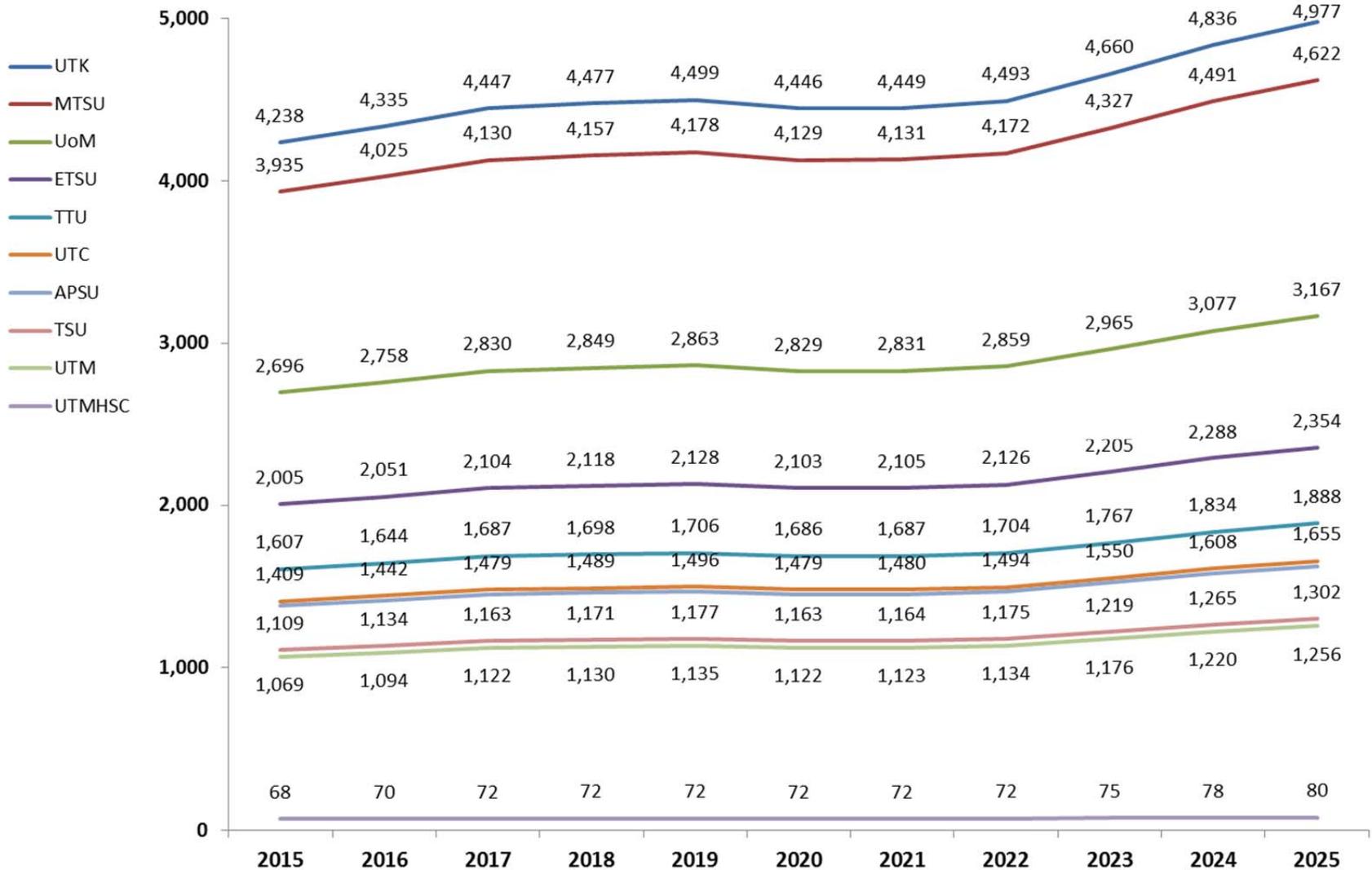


Figure 7. Award Production Projections: Community Colleges

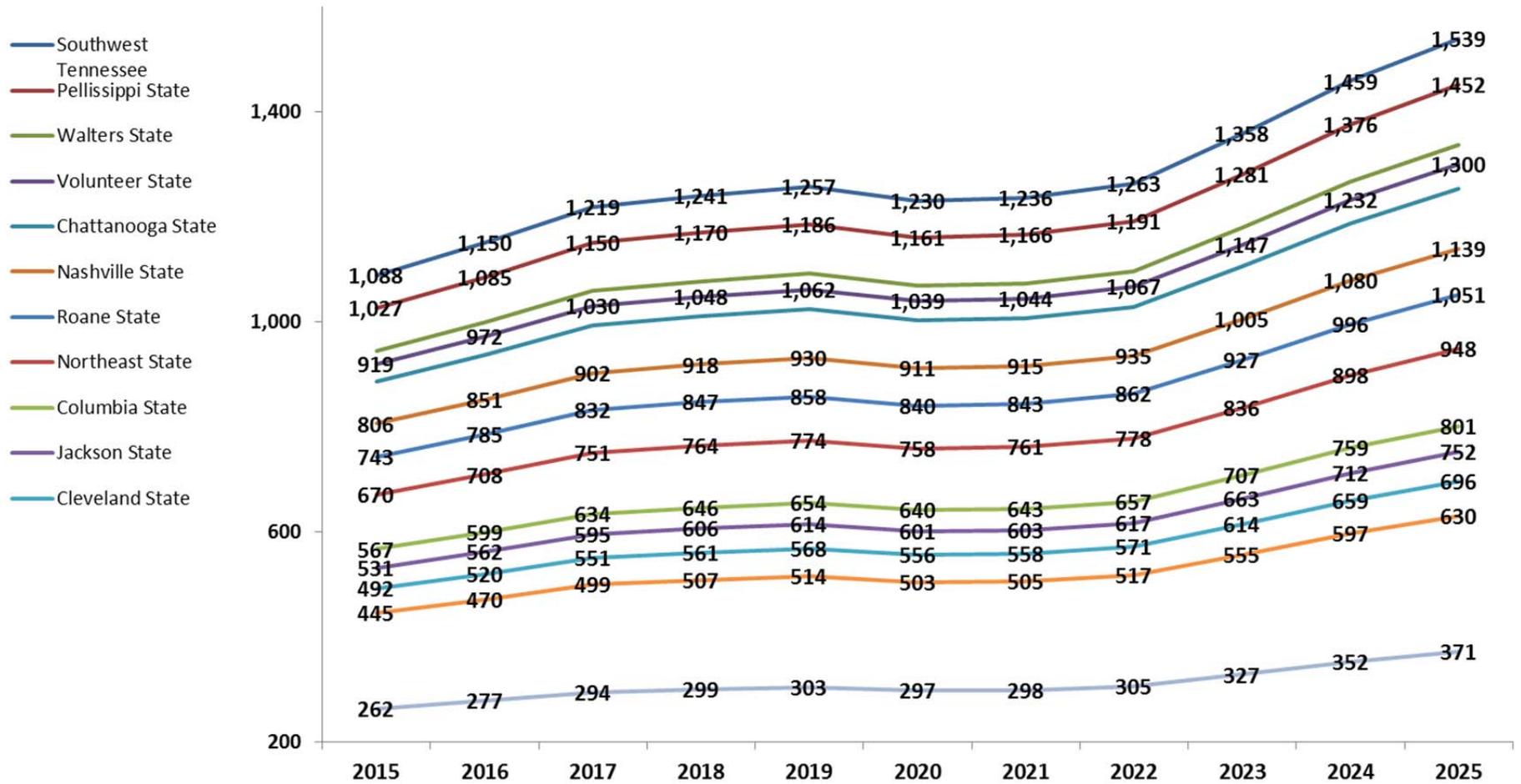


Figure 8. Award Production Projections: Tennessee Centers of Applied Technology

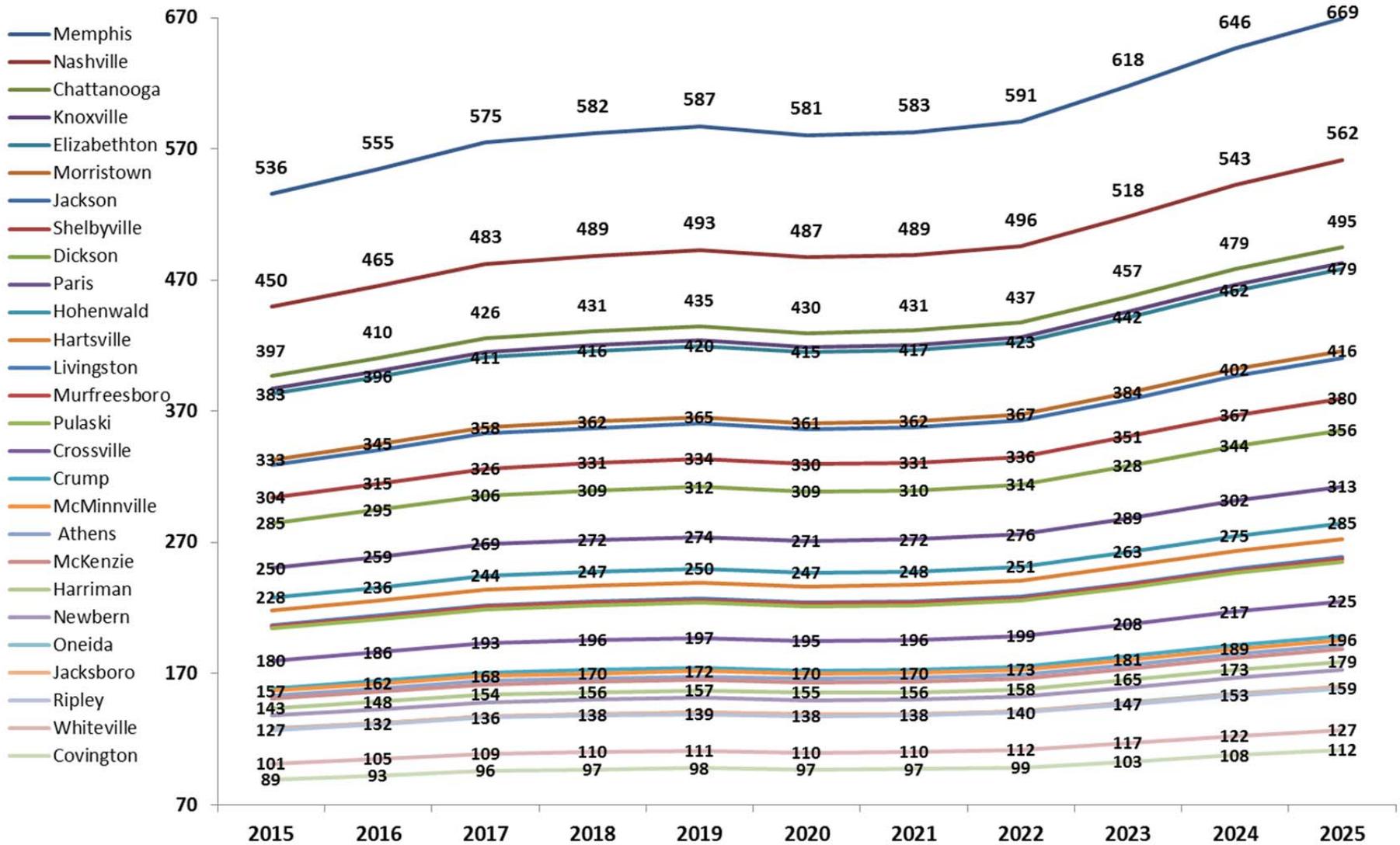
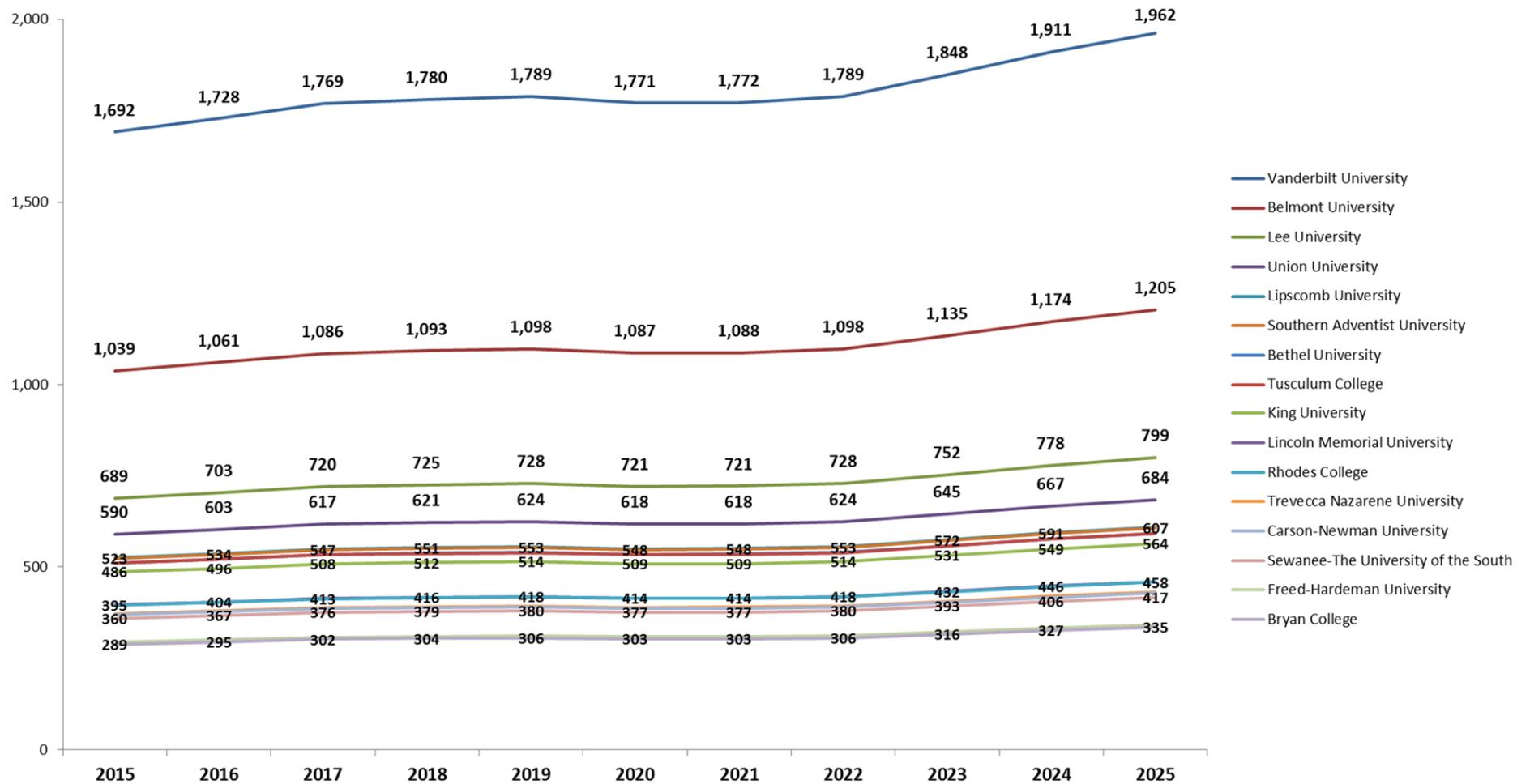


Figure 9. Award Production Projections: Top 20 Private Not-for-profit Institutions⁷



⁷ Top twenty institutions are determined based on the historical share and thus on the projected number of degrees produced.

Table 2. Needed Number of Credentialed Individuals to Meet the D55 Goal

2013	
Working-age adults (25-64 years old)	3,418,195
Adults with associate's or higher (33.1%)	1,132,125
Certificate-holders (assume 4% based on prior research)	136,728
Total: Adults w/ college credentials	1,268,853
Percent of working-age adults w/ college credentials	37.1%
2025	
Projected number of working-age adults (25-64 years old)	3,596,879
The D55 goal	55.0%
Needed number of credentialed individuals	1,978,283

Table 3. Gap: Number of Degrees Needed to Meet the D55 Goal

Total population: 25 < N < 54 in 2013	2,501,840
Residents < 54 with an associate's & higher	953,895
Certificate-holders (assume 4% based on prior research)	100,074
Total number of awards for residents < 54 years	1,053,969
Needed number of credentialed individuals in 2025	1,978,283
Number of awards earned in 2014	69,817
Gap: Number of awards needed to meet the D55 goal	854,498
Annual needed growth to meet the D55 goal	77,682

Table 4. The Overall Gap between the Needed Growth and the Projected Natural Growth in Award Production

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Needed growth	77,682	155,363	233,045	310,726	388,408	466,090	543,771	621,453	699,135	776,816	854,498
Projected natural growth	67,458	136,493	207,336	278,673	350,384	421,278	492,236	563,908	638,226	715,334	794,678
Production at 2014 level	69,817	139,634	209,451	279,268	349,085	418,902	488,719	558,536	628,353	698,170	767,987
Best scenario	69,133	140,396	214,522	289,291	364,557	438,280	511,977	586,795	666,313	750,919	839,642
Worst scenario	65,783	132,590	200,150	268,056	336,212	404,277	472,496	541,022	610,140	679,750	749,715
Overall gap in awards	10,224	18,870	25,709	32,053	38,024	44,812	51,535	57,545	60,909	61,482	59,820

Figure 10. The Overall Gap Between the Needed Growth and the Projected Natural Growth in Award Production

